

TRANQUILITY OA (TO) SERIES



COMMERCIAL VERTICAL DEDICATED OUTDOOR AIR PACKAGED WATER-SOURCE HEAT PUMPS

INSTALLATION, OPERATION & MAINTENANCE

97B0052N01

Revised: 31 January, 2013



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Vertical DOAS

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Model Nomenclature

MODEL TYPE
TO = TRANQUILITY® (HFC-410A) OUTSIDE AIR

CONFIGURATION
HB = HORIZONTAL w/WHEEL AND BYPASS DAMPER
HD = HORIZONTAL NO WHEEL
HW = HORIZONTAL w/ WHEEL
RB = ROOFTOP w/WHEEL AND BYPASS DAMPER
RD = ROOFTOP (OUTDOOR) NO WHEEL
RW = ROOFTOP (OUTDOOR) w/ WHEEL
VF = VERTICAL w/ FILTER BOX (STANDARD)
VD = VERTICAL w/DAMPER BOX

UNIT SIZE
02
03
04 - (VD, VF)
05
08
10
15
20
25
30

REVISION LEVEL
C = CAREL

VOLTAGE

| OPTION | 208-230/60/1 | 208-230/60/3 | 480/60/3 | 575/60/3 | NON-FUSED DISC | GFI |
|--------|--------------|--------------|----------|----------|----------------|-----|
| G | X | - | - | - | - | - |
| H | - | X | - | - | - | - |
| F | - | - | X | - | - | - |
| N | - | - | - | X | - | - |
| A | X | - | - | - | X | - |
| B | X | - | - | - | - | X |
| C | X | - | - | - | X | X |
| D | - | X | - | - | X | - |
| J | - | X | - | - | - | X |
| K | - | - | - | - | X | X |
| L | - | - | X | - | X | - |
| M | - | - | X | - | - | X |
| V | - | - | X | - | X | X |
| P | - | - | - | X | X | - |
| R | - | - | - | X | - | X |
| W | - | - | - | X | X | X |

SUPPLY MOTOR HP

| OPTION | MOTOR HP | w/ VFD |
|--------|----------|--------|
| A | 0.5 | - |
| B | 1 | - |
| C | 1.5 | - |
| D | 2 | - |
| E | 3 | - |
| F | 5 | - |
| G | 7.5 | - |
| H | 10 | - |
| J | 15 | - |
| K | 20 | - |
| L | 25 | - |
| M | 30 | - |
| N | 0.5 | X |
| P | 1 | X |
| Q | 1.5 | X |
| R | 2 | X |
| S | 3 | X |
| T | 5 | X |
| U | 7.5 | X |
| V | 10 | X |
| W | 15 | X |
| 1 | 20 | X |
| 2 | 25 | X |
| 3 | 30 | X |

EXHAUST MOTOR HP

| OPTION | MOTOR HP | w/ VFD |
|--------|----------|--------|
| A | 0.5 | - |
| B | 1 | - |
| C | 1.5 | - |
| D | 2 | - |
| E | 3 | - |
| F | 5 | - |
| G | 7.5 | - |
| H | 10 | - |
| J | 15 | - |
| K | 20 | - |
| L | 25 | - |
| M | 30 | - |
| N | 0.5 | X |
| P | 1 | X |
| Q | 1.5 | X |
| R | 2 | X |
| S | 3 | X |
| T | 5 | X |
| U | 7.5 | X |
| V | 10 | X |
| W | 15 | X |
| 1 | 20 | X |
| 2 | 25 | X |
| 3 | 30 | X |

SUPPLY AIR CONFIGURATION

| OPTION | STANDARD FILTER | STANDARD FILTER WITH PRE-FILTER | MERV 13 FILTER | MERV 13 WITH PRE-FILTER |
|------------------|-----------------|---------------------------------|----------------|-------------------------|
| TOP | T | F | C | J |
| BOTTOM DISCHARGE | B | G | D | K |
| REAR DISCHARGE | A | H | E | L |

RETURN AIR CONFIGURATION

| OPTION | STANDARD FILTER | STANDARD FILTER WITH PRE-FILTER | MERV 13 FILTER | MERV 13 WITH PRE-FILTER |
|-----------------|-----------------|---------------------------------|----------------|-------------------------|
| NONE (NO WHEEL) | N | - | - | - |
| REAR RETURN | A | E | C | G |
| BOTTOM RETURN | B | F | D | H |

HEAT EXCHANGER OPTIONS

| OPTION | NON-COATED COIL | COATED COIL | SIDE WATER CONNECTION | BOTTOM WATER CONNECTION | LEFT HAND ACCESS | RIGHT HAND ACCESS |
|--------|-----------------|-------------|-----------------------|-------------------------|------------------|-------------------|
| B | X | - | X | - | - | X |
| C | X | - | - | X | - | X |
| K | - | X | X | - | - | X |
| L | - | X | - | X | - | X |
| M | X | - | X | - | X | - |
| N | X | - | - | X | X | - |
| P | - | X | X | X | X | - |
| R | - | X | - | X | X | - |

COMMUNICATION OPTIONS

| OPTION | COMMUNICATION CONFIGURATION |
|--------|------------------------------|
| 1 | CONTROLLER WITH NO BMS |
| 2 | CONTROLLER WITH BACnet Enet |
| 3 | CONTROLLER WITH BACnet MS/TP |
| 4 | CONTROLLER WITH LON |
| 5 | CONTROLLER WITH MODBUS |

CONTROLS / MISC OPTIONS
E = LAT (STANDARD)
H = LAT (STANDARD), VFD FOR WHEEL
J = ZONE RESET
M = ZONE RESET, VFD FOR WHEEL
R = NIGHT SETBACK (HB, RB, & VD ONLY)
S = R + VFD FOR WHEEL
T = CO2
U = CO2, VFD FOR WHEEL

Diagram: A box labeled "TOP VIEW" with "O/A (FRONT)" on the left, "REAR" on the right, "RH" at the bottom, and "LH" at the top.

NOTE: A dedicated 115 VAC, 15 Amp circuit (by others) is required on all DOAS units for operation of the factory installed evaporator heat tape(s). Failure to connect heat tape(s) to a proper power supply may lead to freezing of the water in the heat exchanger. Failure of, and/or damage caused by the failure of a heat exchanger due to freezing will be exempt from warranty coverage if the heat tapes are not properly connected and working at the time of the failure.

Notes:

1. Service access side referenced looking into O/A intake.
2. Side water connections are always on the same side as access except for horizontal size 20.
3. Condensate connection same side as water connections.
4. "HW & RW" model configurations are not available with "Top Supply with Bottom Return" option. if digit 14 is "T, F, C, or J" then digit 13 must be "A, E, C, or G".
5. Only applies to "RW" & "HW" model configurations.
6. Only applies to "RB" & "HB" model configurations.
7. Only applies to horizontal and rooftop model configurations.
8. Vertical models use Merv 11 filters only; horizontal and rooftop models use Merv 7 filters as standard.
9. If digit 9 is option "T" or "U", then vfd will need to be selected in digits 11 and 15.
10. Right hand access is standard for horizontal and rooftops. Right hand is not available for verticals. Left hand access is standard for verticals.

Vertical DOAS

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General Information

Safety

Warnings, cautions, and notices appear throughout this manual. Read these items carefully before attempting any installation, service, or troubleshooting of the equipment.

DANGER: Indicates an immediate hazardous situation, which if not avoided will result in death or serious injury. DANGER labels on unit access panels must be observed.

WARNING: Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation or an unsafe practice, which if not avoided could result in minor or moderate injury or product or property damage.

NOTICE: Notification of installation, operation, or maintenance information, which is important, but which is not hazard-related.

⚠ WARNING! ⚠

WARNING! The unit label will indicate which refrigerant is provided. The EarthPure® Application and Service Manual should be read and understood before attempting to service refrigerant circuits with HFC-410A.

⚠ WARNING! ⚠

WARNING! To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state, and federal proficiency requirements.

⚠ WARNING! ⚠

WARNING! The installation of water-source heat pumps and all associated components, parts, and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations.

⚠ WARNING! ⚠

WARNING! All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants. If a compressor is removed from this unit, refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, refrigerant lines of the compressor must be sealed after it is removed.

⚠ CAUTION! ⚠

CAUTION! To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. The mechanical components and filters will quickly become clogged with construction dirt and debris, which may cause system damage.

Inspection - ClimateMaster DOAS units are not designed to support the weight of a person on all portions of the unit roof. Personnel should avoid stepping on the top of the unit. However, if it is necessary to stand on the roof, stay within 18" of the cabinet perimeter.

ClimateMaster inspects and tests each DOAS unit before it leaves the factory so that you receive a quality piece of equipment. However, the DOAS unit may have been damaged in transit. Check the equipment thoroughly for both visible and concealed damage before you sign the receiving papers. Pay particular attention to the roof of the unit on outdoor units. Document any damage in writing on the carrier's bill of lading to ensure that damage claims are handled promptly. If the unit has been damaged, obtain a claim form from the carrier. Promptly fill out and return the form, and notify ClimateMaster of any damage. **DAMAGE CLAIMS OR SHORTAGES MUST BE FILED WITH THE FREIGHT CARRIER WITHIN 5 WORKING DAYS OF RECEIPT OF EQUIPMENT.**

Storage - Equipment should be stored in its original packaging in a clean, dry area. Store units in an upright position at all times. Do not stack units or any other equipment on any DOAS unit.

Unit Protection - Cover units on the job site with either the original packaging or an equivalent protective covering. Cap the open ends of pipes stored on the job site. In areas where painting, plastering, and/or spraying has not been completed, all due precautions must be taken to avoid physical damage to the units and contamination by foreign material. Physical damage and contamination may prevent proper start-up and may result in costly equipment clean-up.

Examine all pipes, fittings, and valves before installing any of the system components. Remove any dirt or debris found in or on these components.

Pre-Installation - ClimateMaster 100% outdoor air DOAS units designed for indoor installations are configured to allow single-side access to regularly maintained components. This means you can make your service connections and perform routine maintenance even when you must install one side of the DOAS unit against a wall or other restriction. The "service side" is determined when the order is placed at the factory. Note that the service side cannot be changed in the field. It is recommended that clearance be provided on all sides to allow for ease of servicability in the event large components require replacement.

Allow a minimum of 36 inches of clearance around the service side of the DOAS unit for piping, electrical connections, and service access. Install the unit on a sturdy, level mounting base or platform that will prevent vibration and sound transmission. Never install the DOAS unit on a wooden platform. Do not install the unit near occupied rooms such as offices or guestrooms. Do not attempt to conserve installation space by fabricating restrictive ductwork with abrupt bends. You may reduce the operating efficiency and the moisture removal capacity of the DOAS unit. See duct system installation section for detailed duct installation instructions.

NOTICE! - YOU MUST NOT INSTALL AN INDOOR-RATED DOAS UNIT IN AN OUTDOOR OR A WET ENVIRONMENT. If you must install the DOAS unit outside you must use an outdoor-rated DOAS unit. ClimateMaster seals and weatherproofs outdoor DOAS units to help prevent water infiltration. You can determine whether your DOAS unit is outdoor-rated by inspecting the unit rating plate (see Section 4.1 for details).

Prepare units for installation as follows:

1. Compare the electrical data on the unit nameplate with ordering and shipping information to verify that the correct unit has been shipped.
2. Keep the cabinet covered with the original packaging until installation is complete and all plastering, painting, etc. is finished.
3. Verify refrigerant tubing is free of kinks or dents and that it does not touch other unit components.
4. Inspect all electrical connections. Connections must be clean and tight at the terminals.
5. Some accessory items such as sensor(s), interface module, etc may be shipped packed in the compressor compartment.

Vertical DOAS

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Rigging - ClimateMaster DOAS units are solidly built and can be very heavy. Avoid personal injury and damaged equipment by planning the installation carefully. Use moving equipment whenever possible.

Moving the DOAS Unit - Use hand trucks, equipment dollies or pipe rollers to move the DOAS Unit into place. Use caution so that the DOAS Unit does not tip over.

⚠ CAUTION! ⚠

CAUTION! Do not tip the DOAS unit on its side. Avoid dropping the unit down stairways or subjecting it to severe mechanical shock. You may seriously damage the unit! Failure to observe these instructions may lead to equipment damage, personal injury, or death.

⚠ CAUTION! ⚠

CAUTION! All three phase scroll compressors must have direction of rotation verified at start-up. Verification is achieved by checking compressor Amp draw. Amp draw will be substantially lower compared to nameplate values. Additionally, reverse rotation results in an elevated sound level compared to correct rotation. Reverse rotation will result in compressor internal overload trip within several minutes. Verify compressor type before proceeding.

⚠ CAUTION! ⚠

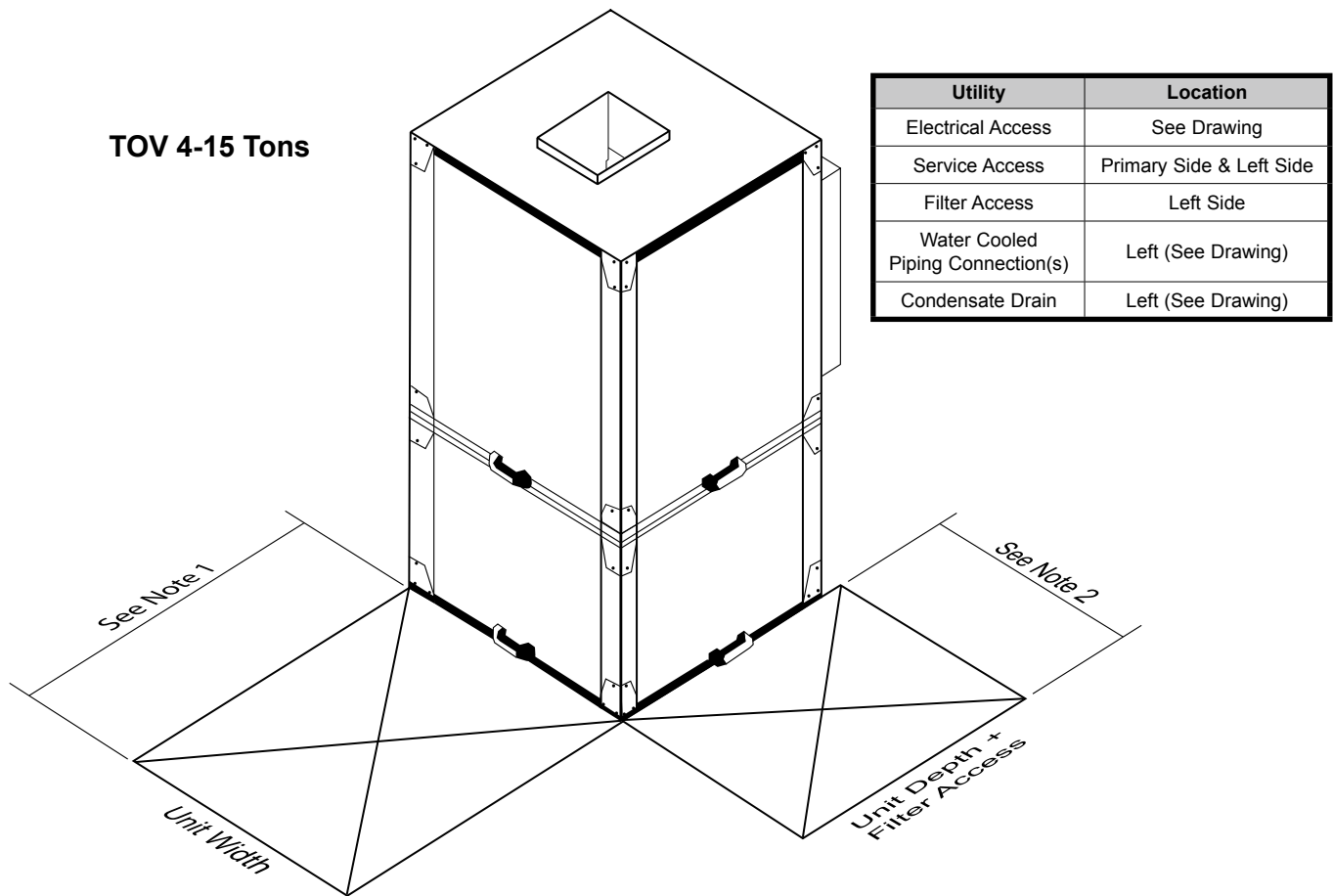
CAUTION! DO NOT store or install units in corrosive environments or in locations subject to temperature or humidity extremes (e.g., attics, garages, rooftops, etc.). Corrosive conditions and high temperature or humidity can significantly reduce performance, reliability, and service life. Always move and store units in an upright position. Tilting units on their sides may cause equipment damage.

⚠ CAUTION! ⚠

CAUTION! CUT HAZARD - Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing heat pumps.

Unit Connections and Service Clearances 4-15 Tons

TOV 4-15 Tons



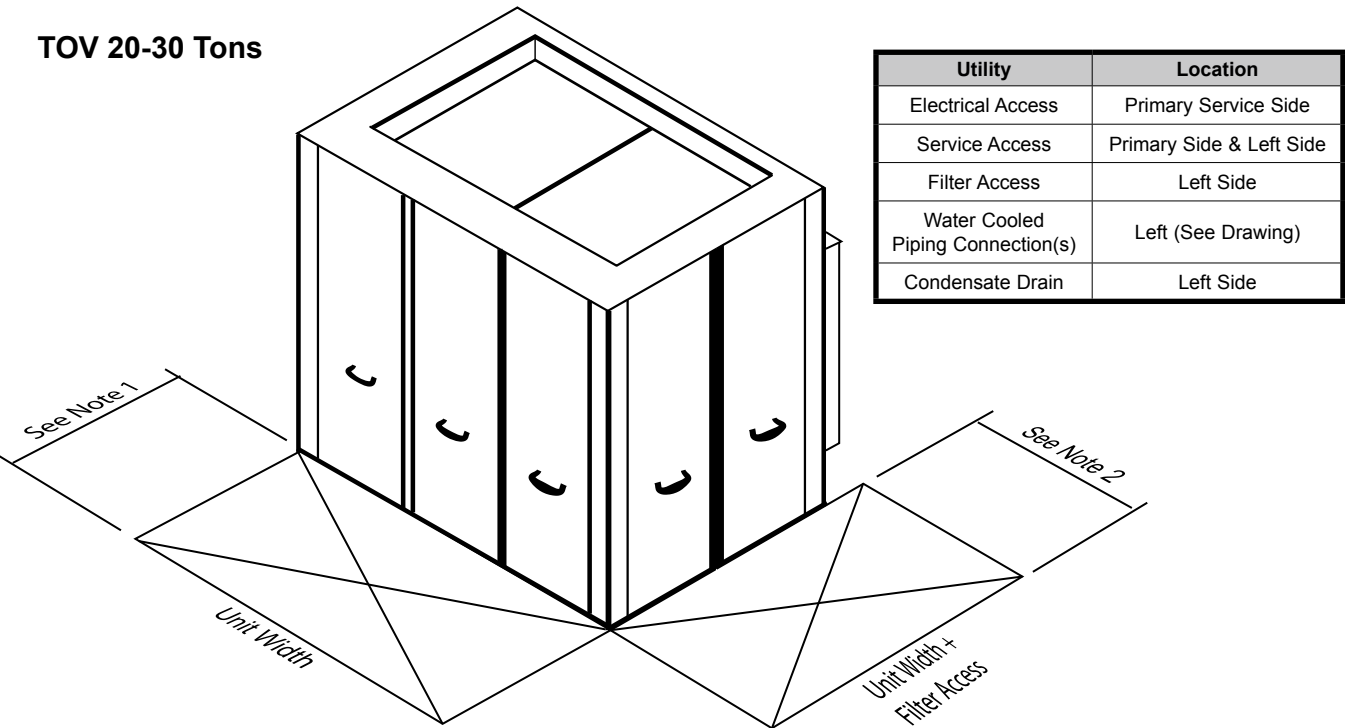
Notes:

1. **Primary Side Access:** **4 & 5 HP Units** require 3' - 0" clearance due to electrical panel. **8, 10, & 15 HP Units** require a minimum of 2' - 0" for service clearance, but 3'-0" is preferred.
2. **Left Service Side Access:** Requires 3'-0" access clearance for service and filter access.
3. If water piping or condensate drain is provided on the right side of the unit opposite the left hand shown, provide adequate space for field connection and any piping specialties.

Vertical DOAS

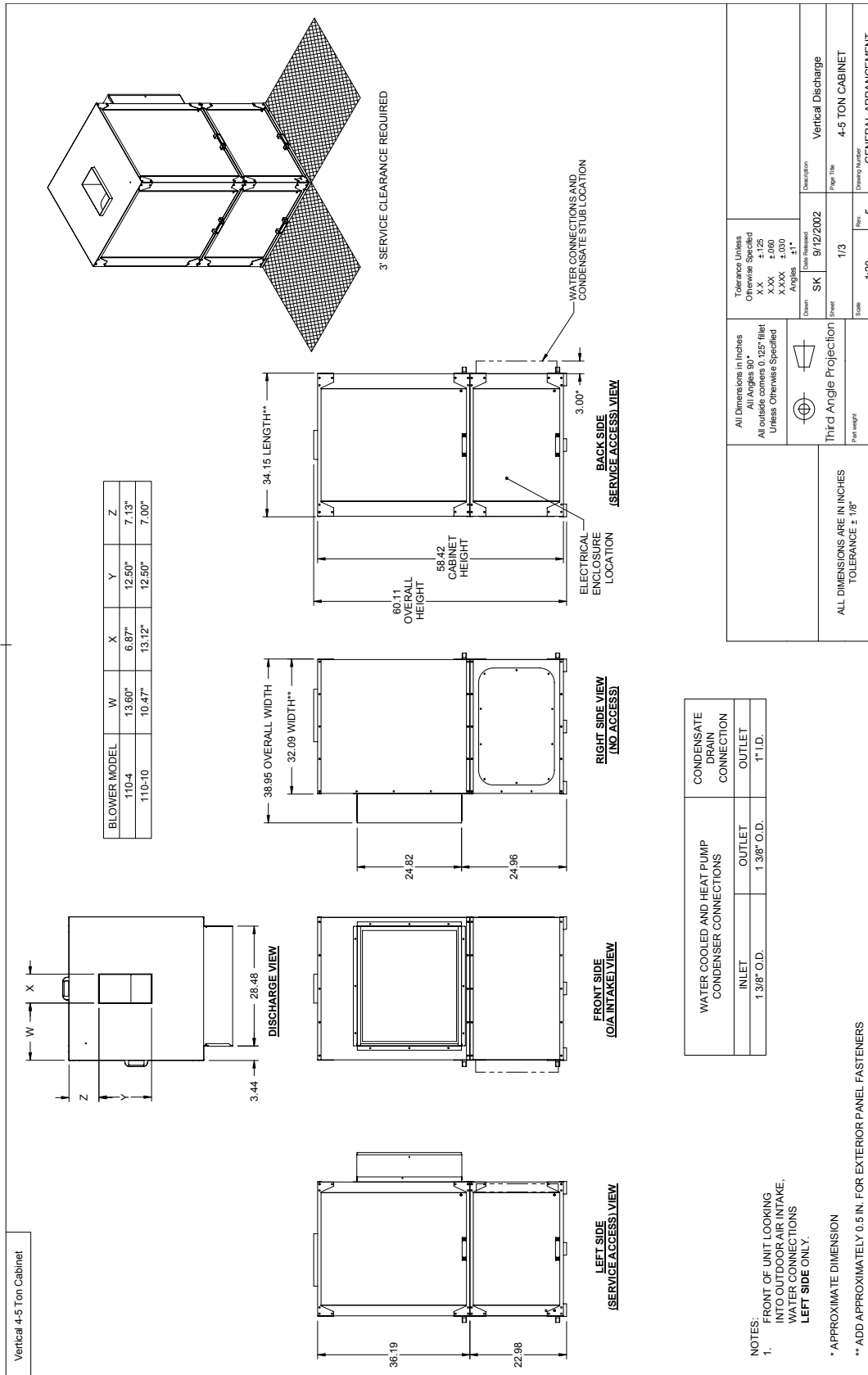
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Unit Connections and Service Clearances 20-30 Tons



- Notes:
- 1. **Primary Service Side Access** require 3' - 0" clearance due to electrical panel.
 - 2. **Left Service Side Access:** Requires 3'-0" access clearance for service and filter access. The unit shown above is standard Left Hand Access. A unit that is Right Hand Access will mirror the left hand access shown above.

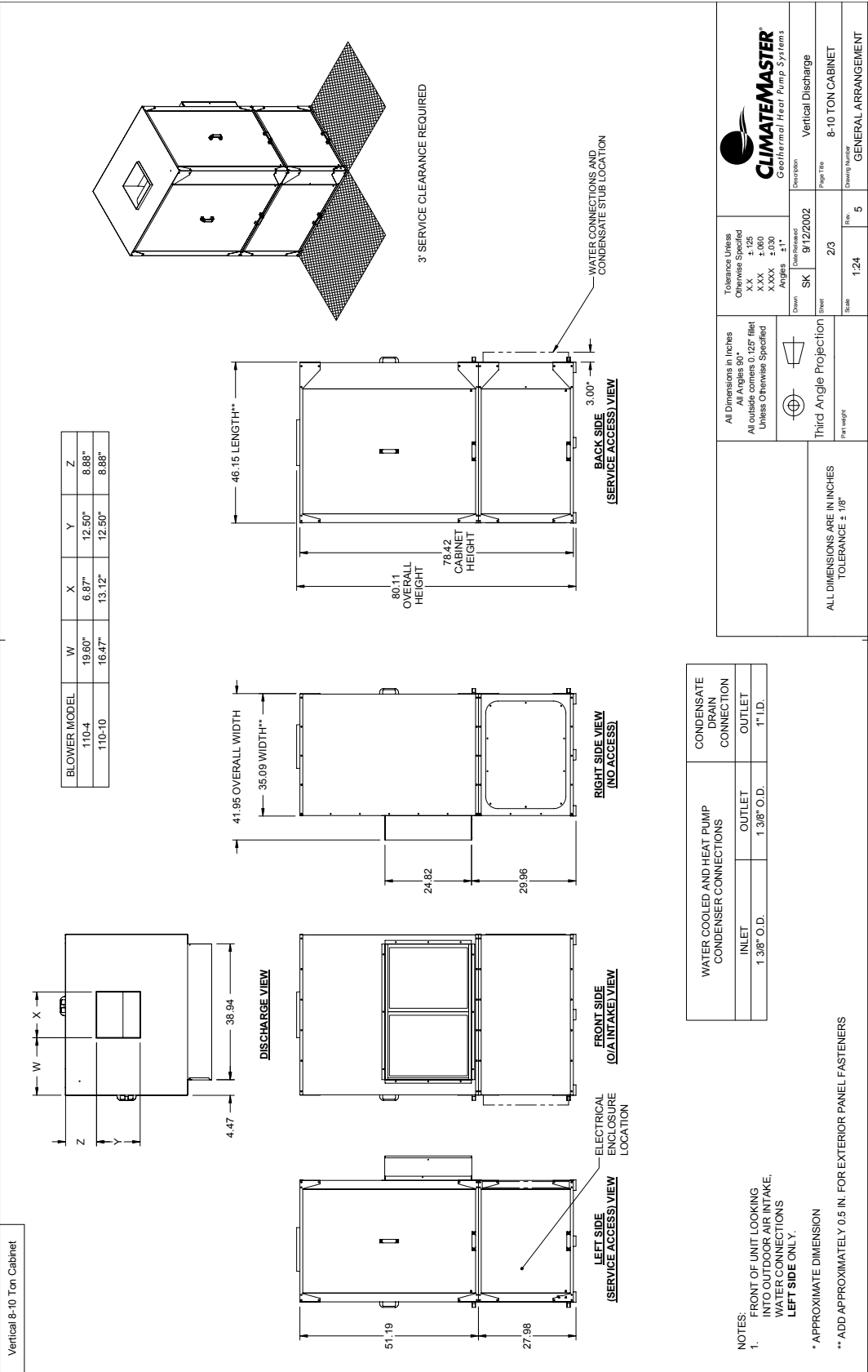
Vertical Dimensional Data Model 04 & 05



Vertical DOAS

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Vertical Dimensional Model 08 & 10



Vertical 15 Ton Cabinet



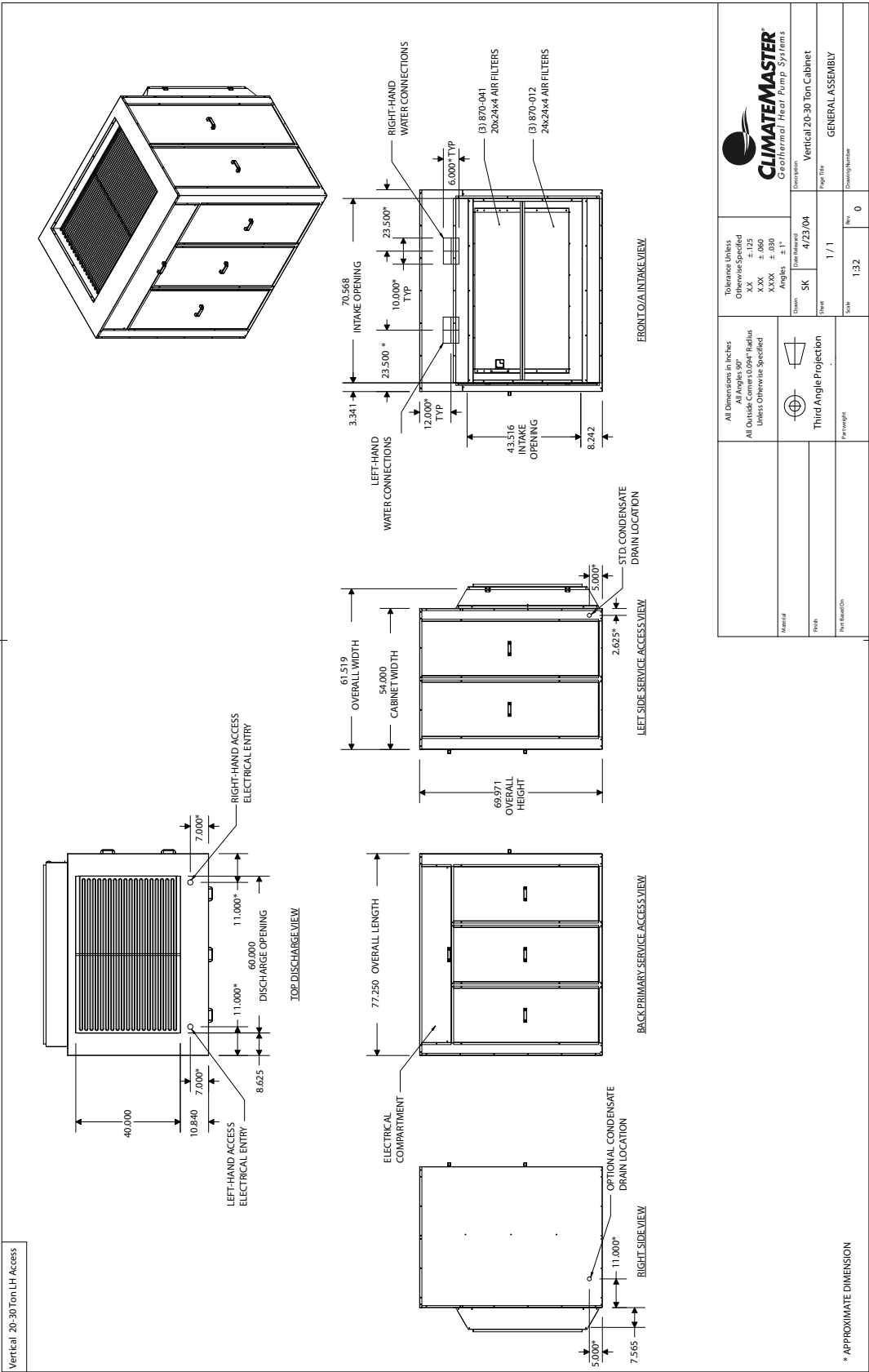
| BLOWER MODEL | W | X | Y | Z |
|--------------|--------|--------|--------|-------|
| 110-10 | 16.47" | 13.12" | 12.50" | 8.88" |
| 120-12 | 15.22" | 15.62" | 13.53" | 8.38" |

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Vertical DOAS

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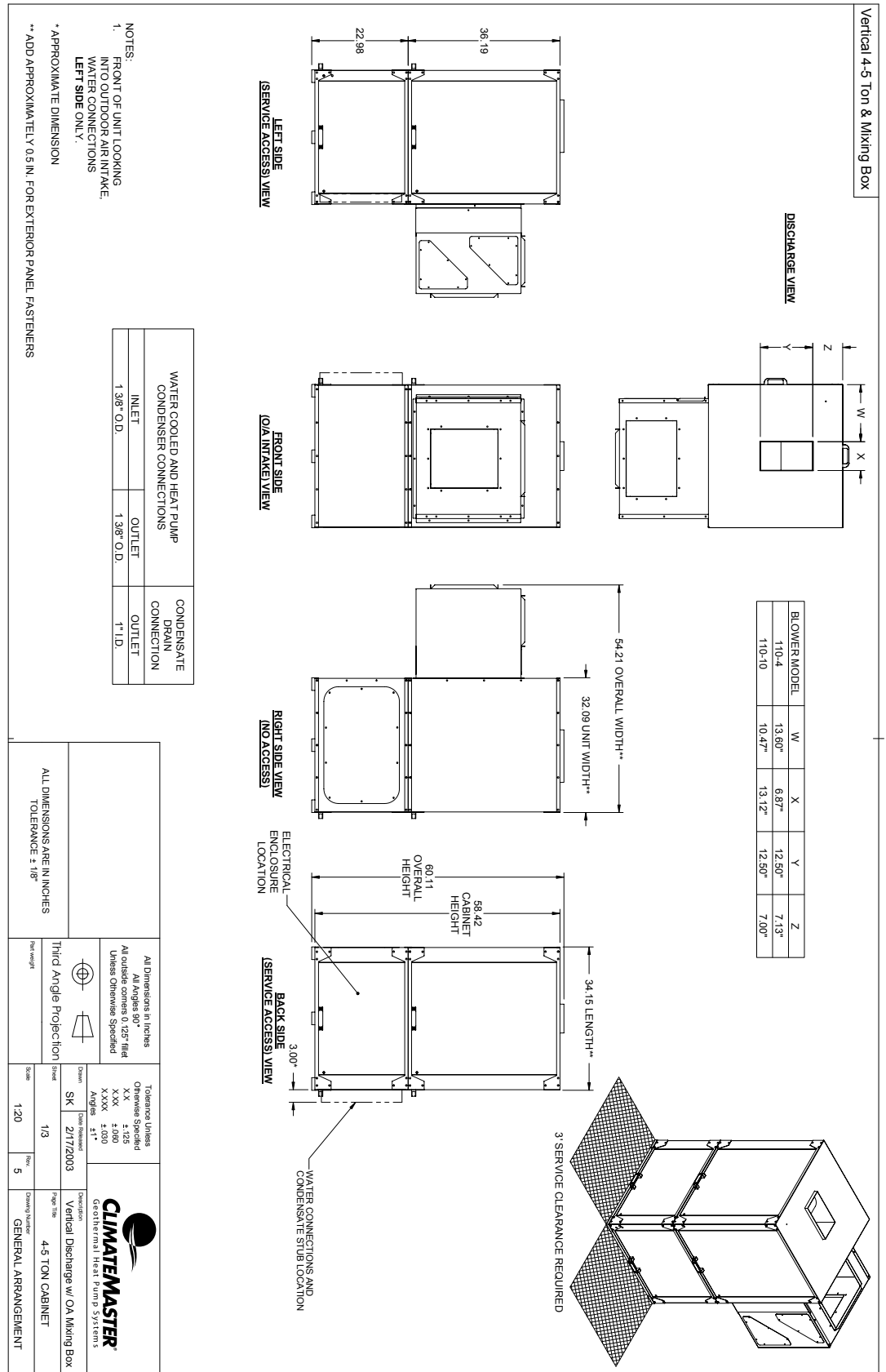
Vertical Dimensional Data - Model 20-30



Vertical DOAS

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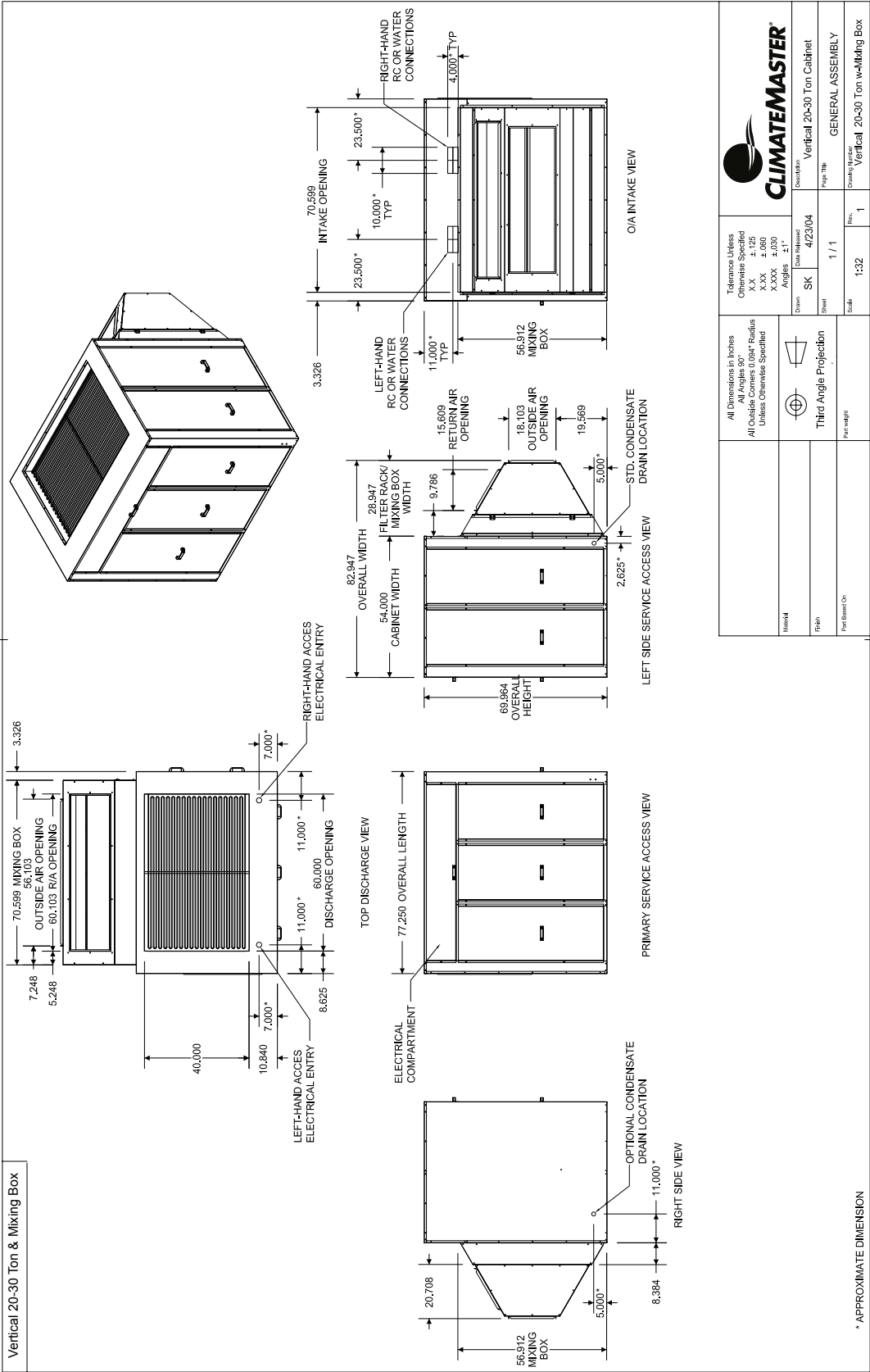
Vertical Dimensional Model 04 & 05



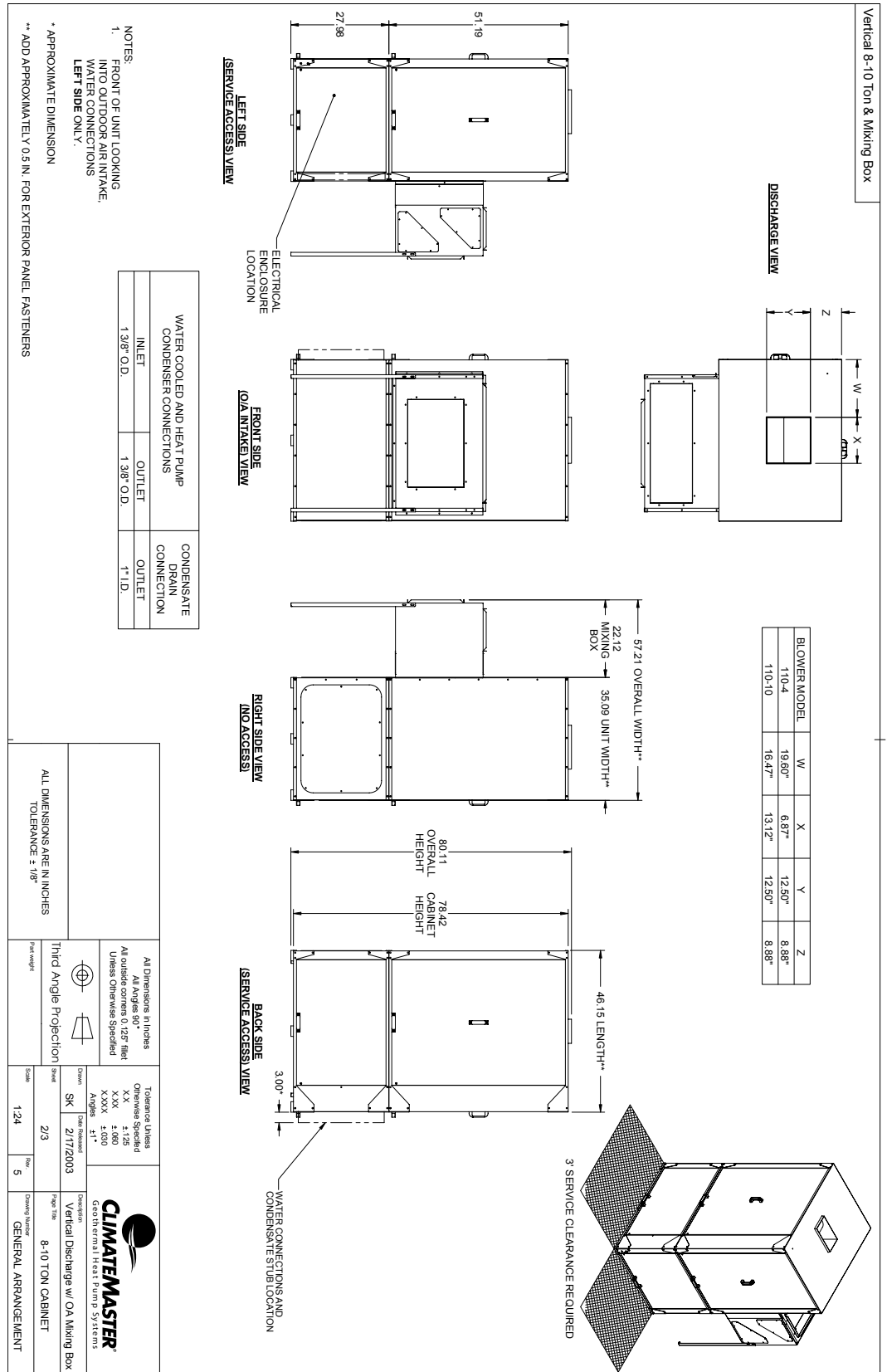
Vertical DOAS

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Vertical With Damper Box Dimensional Data - Model 20 - 30



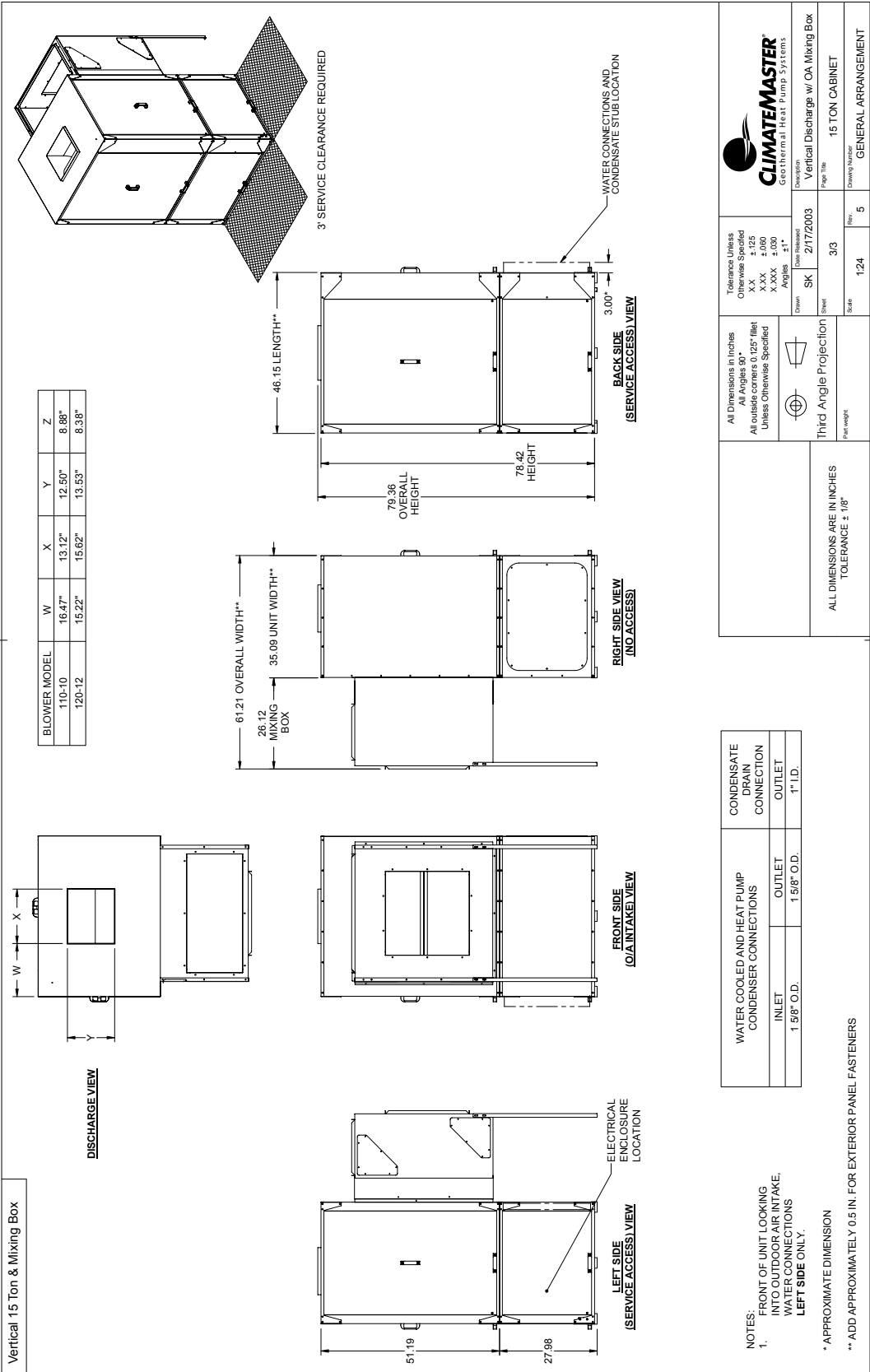
Vertical Dimensional - Model 08 & 10



Vertical DOAS

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Vertical Dimensional - Model 15



TO VF/VD Physical Data Table

| Model | 4 | 5 | 8 | 10 |
|------------------------------|------------------|-----------------|----------------------------|-----------------|
| Fan motor available H.P. | 0.5/1.0/1.5/2.0 | 0.5/1.0/1.5/2.0 | 0.5/1.0/1.5 | 0.5/1.0/1.5/2.0 |
| Blower wheel size | 11-04/11-10 | 11-04/11-10 | 11-04/11-10 | 11-10 |
| Compressor type/qty | Scroll, 1 ea. | | Scroll 2ea. (1 tandem set) | |
| Factory charge lb/unit | | | | |
| HFC-410A Tranquility units | 13 [208] | 15 [240] | 20 [320] | 26 416] |
| Water Connection Size “ O.D. | 7/8" | 1/18" | 1 3/8" | 13/8" |
| Water Flow Rate GPM | 17 | 19 | 26 | 34 |
| Water Pressure Drop PSI/Ft | 5.3/12.23 | 4.0/9.23 | 5.4/12.46 | 6.6/15.22 |
| Condensate Connection Size | 1" | 1" | 1" | 1" |
| Miscellaneous Data | | | | |
| Filter qty/size | (1) 25 X 29 X 4 | (1) 25 X 29 X 4 | (2) 20 X 25 X 4 | (2) 20 X 25 X 4 |
| Filter Type | Merv 11, Pleated | | | |
| Operating Weight | 626 | 643 | 940 | 1002 |
| Shipping Weight | 639 | 666 | 965 | 1033 |

| Model | 15 | 20 | 25 | 30 |
|-----------------------------------|----------------------------|---------------------------------|---------------------------------|---------------------------------|
| Fan motor available H.P. | 1.0/1.5/20./3.0 | 1.0/1.5/20./3.0/5.0/7.5 | 1.0/1.5/20./3.0/5.0/7.5 | 1.0/1.5/20./3.0/5.0/7.5 |
| Blower wheel size | 11-10/12-12 | APAF18-T2 | APAF18-T2 | APAF18-T2 |
| Compressor type/qty | Scroll 2ea. (1 tandem set) | | | |
| Factory charge lb/unit | | | | |
| HFC-410A Tranquility units | 40 [640] | 62 [992] | N/A | 87 [1392] |
| Water Connection Size " O.D. | 15/8" | 25/8" | 25/8" | 25/8" |
| Water Flow Rate GPM | 49 | 69 | 84 | 102 |
| Water Pressure Drop PSI/Ft | 9.4/21.68 | 6.2/14.30 | 6.2/14.30 | 7.1/16.38 |
| Condensate Connection Size | 1" | 1" | 1" | 1" |
| Miscellaneous Data | | | | |
| Filter qty/size | (4) 20 X 20 X 4 | (3) 20 X 24 X 4 (3) 24 X 24 X 4 | (3) 20 X 24 X 4 (3) 24 X 24 X 4 | (3) 20 X 24 X 4 (3) 24 X 24 X 4 |
| Filter Type | Merv 11, Pleated | | | |
| Operating Weight | 1401 | 2467 | 2652 | 2771 |
| Shipping Weight | 1444 | 2569 | 2742 | 2886 |

Note 1: A strainer is required on the ENTERING WATER connection to the DOAS unit.

The strainer must be provided and installed by others.

The strainer must be 60 mesh (250 Micron) or finer.

Failure to install a properly sized strainer can lead to premature fouling and possible failure of a brazed plate heat exchanger.

DOAS units installed and operated without a properly sized strainer will not qualify for warranty coverage.

Note 2: A dedicated 115 VAC, 15 Amp circuit (by others) is required on all DOAS units for operation of the factory installed evaporator heat tape(s). Failure to connect heat tape(s) to a proper power supply may lead to freezing of the water in the heat exchanger. Failure of, and/or damage caused by the failure of a heat exchanger due to freezing will be exempt from warranty coverage if the heat tapes are not properly connected and working at the time of the failure.

Vertical DOAS

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Vertical Installation

Condensate Piping – Vertical Units - The condensate drain connection is on the side of the DOAS unit. Pitch the drainpipe a minimum of 1/4 inch per linear foot, and support it at least every 5 feet. If the drain runs through an unconditioned space, you must install heat tracing to prevent the moisture in the drain from freezing. **NOTE:** While its supply blower runs, the inside of the DOAS Unit operates at a negative pressure. Your Tranquility unit has an internal factory-installed p-trap in the condensate drain to prevent condensate from being drawn into the cabinet of the DOAS unit.

CAUTION!

CAUTION! Ensure condensate line is pitched toward drain 1/8 inch per ft [11mm per m] of run.

Duct System Installation

Duct System Installation - Duct design and installations should conform to the latest ASHRAE and SMACNA low velocity duct standards. Undersized, restrictive ductwork with abrupt turns or transitions can decrease the efficiency and the moisture removal capacity of your DOAS unit. Size the ductwork for an acceptable air pressure drop at the airflow volume of your DOAS unit. Use neoprene flex connectors when you attach ductwork to the DOAS unit to prevent transmission of excess vibration and noise.

Select the grilles, registers and diffusers for low static pressure loss, required throw distance, and the specified CFM rating. You can find this information in most grille manufacturer's catalogs. If you are installing the grilles in a corrosive environment, choose components made from anodized aluminum.

If you must install ductwork in an unconditioned area, use fiberglass duct wrap with vapor barrier facing. You must install the outdoor air intake away from any sources of airborne contamination such as exhaust fans or plumbing vents. You can use galvanized sheet metal ducts for most applications. However, you should use aluminum or stainless steel ducts for extreme applications such as chemical-laden environments.

Unit Air Flow - Each ClimateMaster DOAS unit is designed to operate at a specified air flow rate. System air flow must be checked prior to troubleshooting the refrigeration circuit to assure that such problems are not actually caused by improper unit air flow.

Problems with excessive airflow include:

- Reduction in moisture removal capacity.
- High amperage draw by the blower motor.
- Water carry over from evaporator coil.
- Excessive unit noise levels.

Problems with inadequate airflow include:

- Violation of ventilation codes.
- Risk of evaporator coil freezing.
- Possibility of premature compressor failure.

Determining System Air Flow - The total air flow of a ClimateMaster 4-ton through 15-ton system should be checked by measuring the air pressure drop across both the evaporator and reheat coil between port #1 (low side) and port #2 (high side) as shown in Figure 1.

The total air flow of a ClimateMaster 20-ton through 30-ton system should be checked by measuring the air pressure drop across only the reheat coil as shown in Figure 2. Note: Port #1 is measuring the internal cabinet pressure downstream of the evaporator (high side) and port #2 is added to the discharge duct in the field, downstream of the reheat coil (low side).

A Magnehelic® or inclined manometer with a range of 0.0-1.0 inch water column will work well for this. ClimateMaster DOAS units feature an adjustable blower sheave to simplify air balancing. Utilize the following procedure to determine system airflow:

1. Check the condition of the air filters and coils. Assure that they are clean.
2. Check for any obvious restrictions in the ductwork.
3. Drive the outdoor air damper open, start the supply air blower and energize the field-installed exhaust air blower by turning on the "occupied" switch.
4. Use a Magnehelic® or inclined manometer to measure the air pressure drop across ports #1 and #2. Refer to Figures 1 & 2 to determine your unit cabinet configuration and the air sampling port locations. Compare this value to the value printed on the air flow label on the side of the DOAS unit.
5. Change the air flow, if necessary, by adjusting the motor pulley or any balancing dampers in the field-installed ductwork.

Always measure the current draw of the blower motor after you make any changes to the air flow quantity. If the motor draws more than its FLA rating but the total air flow is still low, check the resistance of the ductwork. Verify that all grilles and dampers have been opened and that there are no sudden turns or restrictions in the ductwork.

▲ WARNING! ▲

WARNING! - Disconnect power before adjusting blower. Failure to disconnect power could result in death or serious injury.

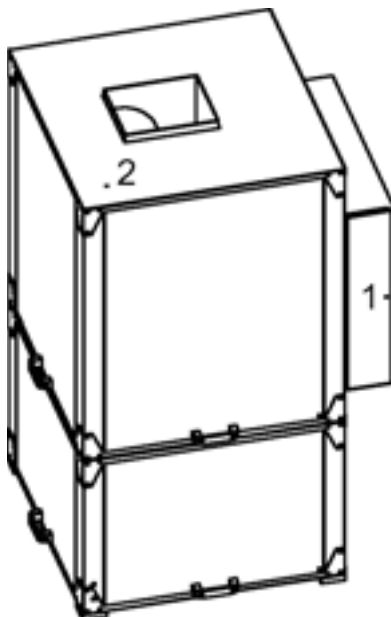
Vertical DOAS

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Recommended Duct Designs - You must use proper duct design to ensure that the DOAS unit operates efficiently and without problems. Undersized or restrictive ducts reduce the system air flow which can cause premature compressor failure. Use the proceeding diagrams as a guide when you design the duct system.

Blower Adjustment Procedure - Change the blower speed by adjusting the motor pulley. To adjust the variable pitch pulley, first loosen the set screw. To slow down the blower, turn the outer pulley face counterclockwise (to decrease its pitch diameter). To speed up the blower, turn the outer pulley face clockwise (to increase its pitch diameter).

Figure 1: Air Balance Ports for Models 4 - 15 Ton Cabinets



After every adjustment be sure to:

- Tighten the set screw against the flat spot on the pulley hub so you don't damage any threads.
- Adjust the belt tension if needed.
- Check to assure that the blower motor current draw does not exceed the rating printed on the rating plate.

If the blower motor current draw exceeds its rating but your airflow is still too low, the static pressure losses in the ductwork and grilles may be higher than the unit was designed for. If this happens, consult the ClimateMaster Service Department. Please be prepared with system serial and model number.

⚠ WARNING! ⚠

WARNING! - Disconnect power before adjusting blower. Failure to disconnect power could result in death or serious injury.

Figure 2: Air Balance Ports for Models 20 - 30 Ton Cabinets

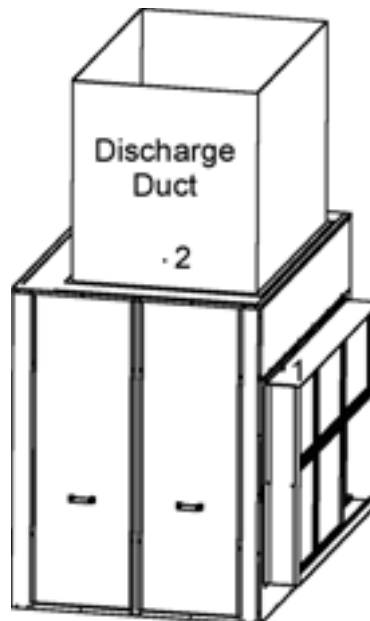
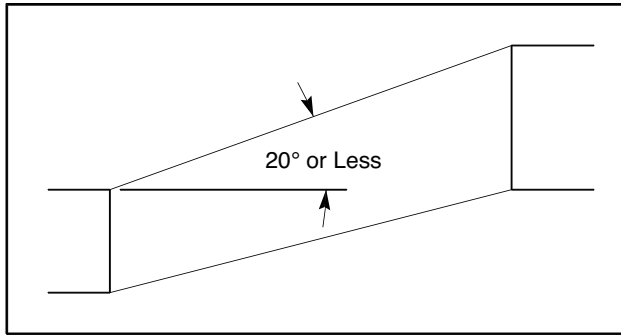
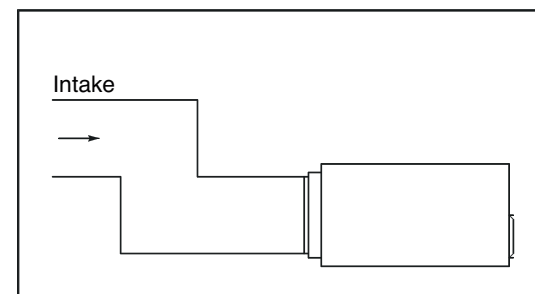
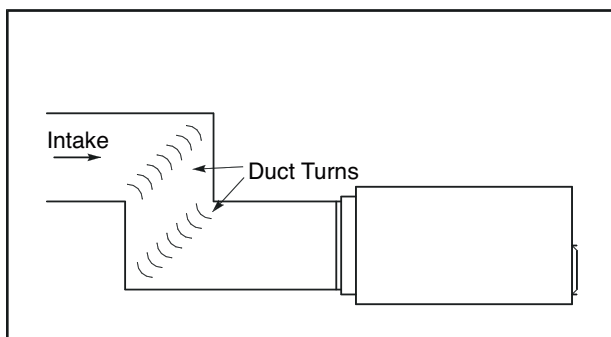
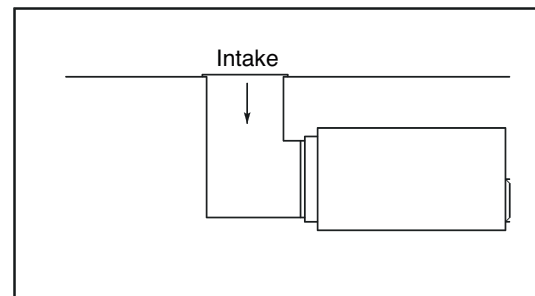
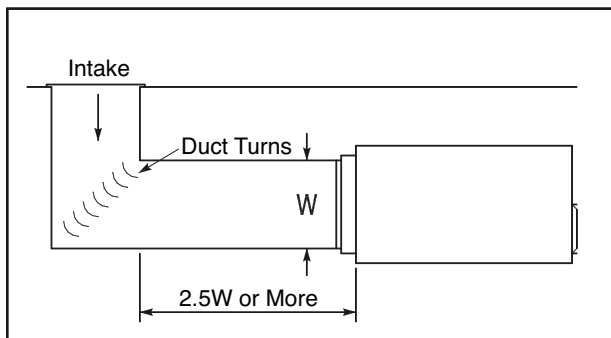
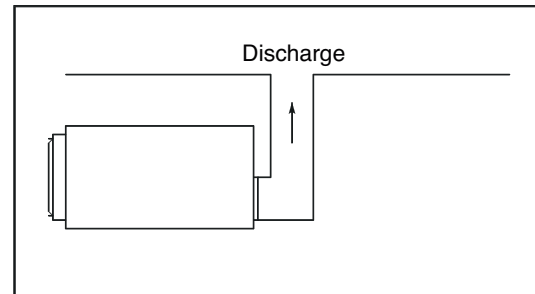
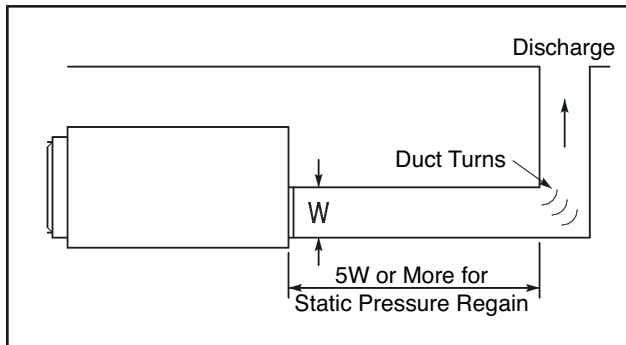
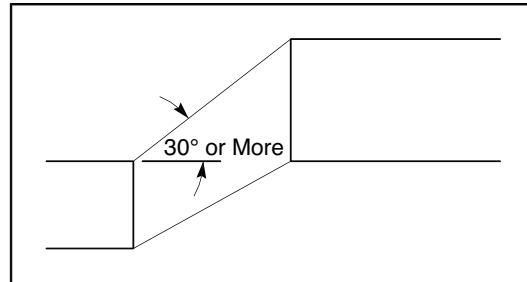


Figure 3: Recommended Duct Design for DOAS Units

Recommended



Not Recommended



Vertical DOAS

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Piping Installation

⚠ WARNING! ⚠

WARNING! Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with HFC-410A refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing HFC-410A as system failures and property damage may result.

⚠ CAUTION! ⚠

CAUTION! Corrosive system water requires corrosion resistant fittings and hoses, and may require water treatment.

⚠ CAUTION! ⚠

CAUTION! Do not bend or kink supply lines or hoses.

NOTICE! Do not allow hoses to rest against structural building components. Compressor vibration may be transmitted through the hoses to the structure, causing unnecessary noise complaints.

⚠ CAUTION! ⚠

CAUTION! Piping must comply with all applicable codes.

Water Piping Installation - Your DOAS unit is equipped with connections for a WSHP or geothermal loop. Use standard piping practices when connecting to the DOAS unit. A 60 mesh [250 micron] or finer strainer must be installed in the water inlet line. Install an air eliminator at any high points in the water piping. Air trapped in the water circuit of the dehumidifier can lead to elevated operating pressures, unexpected service calls and decreased equipment life. Flush field-installed piping thoroughly before you first put the dehumidifier into service.

To prevent premature failure of the heat exchanger, maintain the water at a pH of 7.4, but never below 6.0. Do not use water with high concentrations of sulfur, chlorine, or sodium chloride.

A dedicated circulating pump must be used unless the main pump can develop enough head to overcome the combined resistance of the water condenser and the piping connected to it. If the water system is connected to a variable frequency drive or to water loops with multiple units, flow regulating valves should be installed.

The flow rate and antifreeze concentration (if used) will depend on your application. Standard water heat exchangers are designed for the following entering fluid conditions; 35 - 105°F with 0 - 30% glycol concentrations. Standard flow rates and pressures for these conditions are listed in Table 1a. Units with custom flow rates, head pressures, entering water temperatures and/or glycol concentrations that deviate from the listed standards should reference the custom water flow label affixed to the exterior cabinet of the dehumidifier next to the water connections. It is a good practice and recommended to always first refer to the flow rate and head pressure shown on the label on the exterior of the unit.

Table 1: Loop Flow Rates and Pressure Drop

| Unit Size Nominal Tons | Building or Geothermal Loop | |
|---------------------------|-----------------------------|----------------------|
| | GPM | Pressure Drop in PSI |
| 04 | 17 | 5.3 |
| 05 | 19 | 4.0 |
| 08 | 26 | 5.4 |
| 10 | 34 | 6.6 |
| 15 | 49 | 9.4 |
| 20 | 69 | 6.2 |
| 25 | 84 | 6.2 |
| 30 | 102 | 7.1 |

Notes:

- All pressures in PSI/FT HD
- Building loop temperature range must be pure water between 55°F and 95°F. Geothermal loop temperature range must be 30% glycol between 35°F and 105°F.
- Consult factory for applications outside of these conditions.
- Install an air eliminator at any high points in the water piping. Air trapped in the water circuit of the DOAS unit can lead to elevated operating pressures, unexpected service calls, and decreased equipment life.
- ClimateMaster strongly recommends all piping connections, both internal and external to the unit, be pressure tested for leakage by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. ClimateMaster will not be responsible or liable for damages from water leaks due to inadequate or a lack of pressurized leak testing during installation.

⚠ WARNING! ⚠

WARNING! Excessive flow rates will erode the water heat exchanger(s) and piping!

Water Quality Standards

Table 2: Water Quality Standards

| Water Quality Parameter | HX Material | Closed Recirculating | Open Loop and Recirculating Well | | |
|--|-------------|---|--|-------------|--------------|
| Scaling Potential - Primary Measurement | | | | | |
| Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below. | | | | | |
| pH/Calcium Hardness Method | All | - | pH < 7.5 and Ca Hardness <100ppm | | |
| Index Limits for Probable Scaling Situations - (Operation outside these limits is not recommended) | | | | | |
| Scaling indexes should be calculated at 150°F for direct use and HWG applications, and at 90°F for indirect HX use. A monitoring plan should be implemented. | | | | | |
| Ryznar Stability Index | All | - | 6.0 - 7.5 If >7.5 minimize steel pipe use. | | |
| Langelier Saturation Index | All | - | -0.5 to +0.5 If <-0.5 minimize steel pipe use. Based upon 150 °F HWG and Direct well, 85°F Indirect Well HX | | |
| Iron Fouling | | | | | |
| Iron Fe ²⁺ (Ferrous) (Bacterial Iron potential) | All | - | <0.2 ppm (Ferrous) If Fe ²⁺ (ferrous)>0.2 ppm with pH 6 - 8, O2<5 ppm check for iron bacteria | | |
| Iron Fouling | All | - | <0.5 ppm of Oxygen Above this level deposition will occur. | | |
| Corrosion Prevention | | | | | |
| pH | All | 6 - 8.5 Monitor/treat as needed | 6 - 8.5 Minimize steel pipe below 7 and no open tanks with pH <8 | | |
| Hydrogen Sulfide (H2S) | All | - | <0.5 ppm At H2S>0.2 ppm, avoid use of copper and copper nickel piping or HX's. Rotten egg smell appears at 0.5 ppm level. Copper alloy (bronze or brass) cast components are OK to <0.5 ppm. | | |
| Ammonia ion as hydroxide, chloride, nitrate and sulfate compounds | All | - | <0.5 ppm | | |
| Maximum Chloride Levels | | | Maximum Allowable at maximum water temperature. | | |
| | | | 50°F (10°C) | 75°F (24°C) | 100°F (38°C) |
| | Copper | - | <20ppm | NR | NR |
| | CuproNickel | - | <150 ppm | NR | NR |
| | 304 SS | - | <400 ppm | <250 ppm | <150 ppm |
| | 316 SS | - | <1000 ppm | <550 ppm | < 375 ppm |
| | Titanium | - | >1000 ppm | >550 ppm | >375 ppm |
| Erosion and Clogging | | | | | |
| Particulate Size and Erosion | All | <10 ppm of particles and a maximum velocity of 6 fps. Filtered for maximum 250 micron size. | <10 ppm (<1 ppm "sandfree" for reinjection) of particles and a maximum velocity of 6 fps. Filtered for maximum 250 micron size. Any particulate that is not removed can potentially clog components. | | |

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The ClimateMaster Water Quality Table provides water quality requirements for ClimateMaster coaxial heat exchangers. When water properties are outside of those requirements, an external secondary heat exchanger must be used to isolate the heat pump heat exchanger from the unsuitable water. Failure to do so will void the warranty for the coaxial heat exchanger.

Notes:

- Closed Recirculating system is identified by a closed pressurized piping system. Recirculating open wells should observe the open recirculating design considerations.
- NR - Application not recommended.
- "-" No design Maximum.

Vertical DOAS

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Electrical Wiring - Line Voltage

⚠ WARNING! ⚠

WARNING! To avoid possible injury or death due to electrical shock, open the power supply disconnect switch and secure it in an open position during installation.

⚠ CAUTION! ⚠

CAUTION! Use only copper conductors for field installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

Wire and Fuse Sizing - The field-installed power supply wires and overcurrent devices must be sized to handle the minimum ampacity of the DOAS unit without exceeding the maximum fuse size rating. Both the minimum ampacity and the maximum fuse size are printed on the unit rating plate.

High Voltage Connections - On single phase units the power supply must have 3 connections (2 power, 1 ground). On three phase units the power supply must have 4 connections (3 power, 1 ground). Connect the power supply wires to the main power block located in the upper section of the electrical compartment.

Electrical - Line Voltage - All field installed wiring, including electrical ground, must comply with the National Electrical Code as well as all applicable local codes. Refer to the unit electrical data for fuse sizes. Consult wiring diagram for field connections that must be made by the installing (or electrical) contractor. All final electrical connections must be made with a length of flexible conduit to minimize vibration and sound transmission to the building.

General Line Voltage Wiring - Be sure the available power is the same voltage and phase shown on the unit serial plate. Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

Auxiliary Line Voltage Wiring - A dedicated 115 VAC, 15 Amp circuit (by others) is required on all DOAS units for operation of the factory installed Heating Evaporator heat tape(s). Failure to connect heat tape(s) to a power supply may lead to freezing and possibly failure of the heat exchanger. Failure of, and/or damage caused by the failure of a heat exchanger due to freezing will be exempt from warranty coverage if the heat tapes are not properly connected at the time of the failure.

Figure 4: Single Phase Wiring

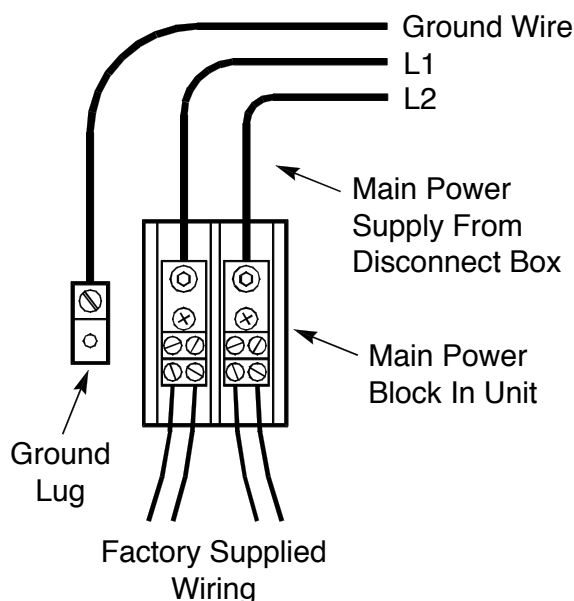
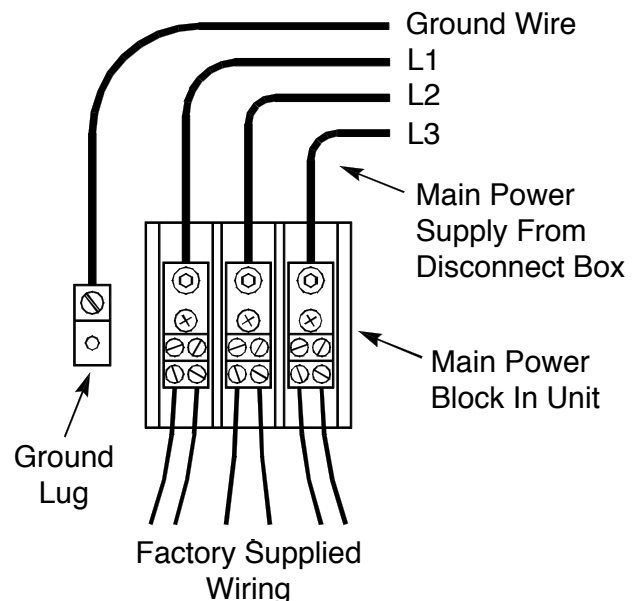


Figure 5: Three Phase Wiring



Electrical Wiring - Low Voltage

Controls Wiring - Many of the controls and sensors in the ClimateMaster Tranquility DOAS units have been factory-installed and wired. However, you will have to make certain connections in the field.

Occupancy Contact - ClimateMaster makeup air DOAS units as standard are pre-wired to work from a field-provided occupancy timer, switch, or dry contact closure from a building management system, which will start the supply blower during periods of occupancy. Whether this switch is manually activated or a relay activated by a building energy management system, its contacts must be rated for at least 10 VA at 24 VAC.

Intake Damper Actuator - Tranquility DOAS units ordered for outdoor or roof-curb installation are supplied with a factory-installed outdoor air intake hood package. This option includes filters, dampers, and a motorized spring-return actuator.

The outdoor air intake louvers, dampers and actuators must be field-provided for indoor DOAS units. The actuator (by others) must be a 24 VAC, spring-return device with on-off floating control and a normally-open end switch. The end switch will energize the supply blower of the DOAS unit once the damper has opened completely. This helps minimize the required actuator torque and reduces static pressure related issues in the ductwork. See the wiring schematic for connection details.

Exhaust Blower Contact - ClimateMaster makeup air DOAS units are equipped with a single-pole dry contact that can be interlocked with a field-provided exhaust blower. This dry contact, which is rated for 10A at 24 or 240 VAC, will close to start the exhaust fan whenever the supply blower of the DOAS unit is running. See the wiring schematic for connection details.

System Air Temperature Sensors - All Tranquility DOAS units are provided with at least one field-installed air temperature sensor, depending on the controls sequence chosen.

Duct-Mount Sensor - A duct-mount sensor is normally used when continuous blower operation is desired or required. A duct-mount sensor helps ensure consistent temperature and humidity levels throughout the space. One drawback of this sensor is that it relies on a continuous stream of air moving past it. Using a duct-mount sensor with a non-continuous blower may lead to short-cycling of the refrigeration compressor.

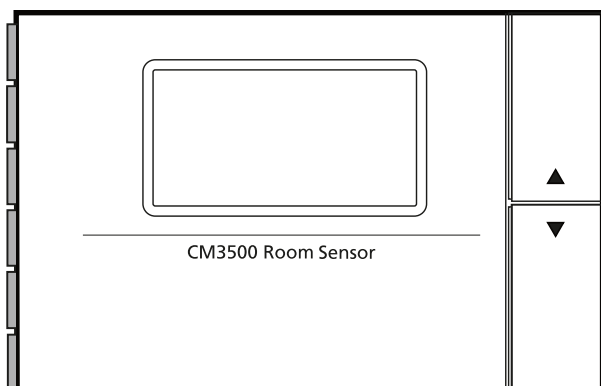
Install the duct-mount sensor in the supply air duct downstream from an auxiliary heater (if used). Do not mount the sensor in a section of duct where false readings may occur due to dead air regions, solar heat gain or thermal losses in winter. Do not mount the sensor where water is likely to drip on it. Liquid moisture may damage the humidity sensing element in the sensor. Run two, 18 gauge (0-500 feet) or two, 24 gauge (0-100 feet) wires from the sensor to the labeled terminal strip in the control panel of the DOAS unit. See your wiring schematic for connection details. Note that undersized wiring will cause inaccurate sensor readings. Do not run sensor wiring adjacent to or in the same conduit as wires carrying more than 24 VAC.

Remote Room Sensor(s) - ClimateMaster DOAS units ordered with the room reset of supply air temperature (RRSAT) option are supplied with a remote room sensor. Up to four of these sensors may be wired to the system.

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Figure 6: Remote Room Sensor



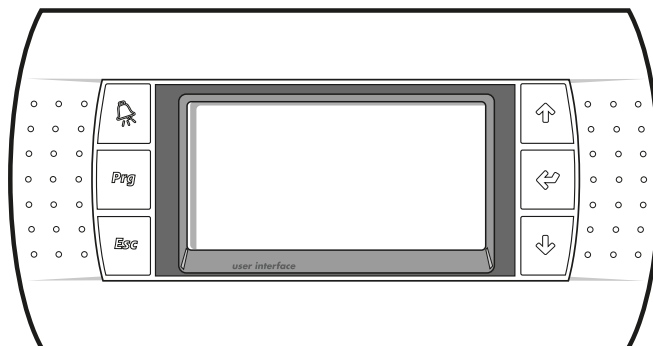
This wall-mountable display is an IP30 rated device. Ambient conditions must be between 32.0°F and 120.0°F and less than 85% RH. The controller's RS485 serial interface communicates via three-way plug-in terminals. Use a twisted pair plus shielded cable, 20-22 AWG. Total length of the network must not exceed 1,500 feet. The capacitance between the wires must not exceed 90 pF/M. See your wiring schematic for connection details. Note that undersized wiring will cause inaccurate sensor readings.

These remote devices require a separate 24Vac 50/60HZ 1.5VA power connection. Provide a dedicated 250mA T fuse for each sensor. Use a class 2 safety transformer with a minimum rating of 4VA. If the sensor is wired to F1 and F2 of the DOAS unit control panel terminal, G0 must be connected to F2.

Do not run sensor wiring adjacent to, or in the same conduit as wires carrying more than 24 VAC.

Mounting the Remote Terminal - The remote terminal must be located in a dry, non-corrosive environment. Operating conditions must be between 0.0°F and 140.0°F and less than 90% RH. Moisture or chemicals can damage the circuitry of the display. The display can either be affixed directly to the DOAS unit (indoor models only) or located up to 20 feet away using the cable that came with the display.

Figure 7: Remote Terminal



Installing the Remote Terminal - The remote terminal is an IP40 device and is powered through the cable provided. If a longer length is required, a standard 24 AWG, 6 conductor phone cable may be used up to 150 feet. For location of the sensor up to 1,500 feet, use 22 AWG, 3 twisted pair cable. See your wiring schematic for connection details. Pull the cord and connector through the hole in the back of the mounting bracket. Attach the bracket to the wall. After plugging the cord into the back of the remote display, feed any extra wiring back into the hole of the mounting bracket and gently snap the remote display into the bracket.

⚠ CAUTION! ⚠

CAUTION! Do not run the remote terminal wiring in the same conduit as, or adjacent to wires carrying over 30 volts!

Controls Wiring - Many of the controls and sensors in the ClimateMaster Tranquility DOAS units have been factory-installed and wired. However, you will have to make certain connections in the field.

Occupancy Contact - ClimateMaster makeup air DOAS units as standard are pre-wired to work with a field-provided occupancy timer, switch, or dry contact closure from a building management system, which will start the supply blower during periods of occupancy. Whether this switch is manually activated or a relay activated by a building energy management system, its contacts must be rated for at least 10 VA at 24 VAC.

Unit Starting & Operating Conditions

Table 3: Operating Limits Table

| Air Limits | VF/VD Models | |
|------------------------|----------------------|----------------|
| | Cooling/Dehumid Mode | Heating Mode |
| Minimum Ambient Air | 40°F [4.4°C] | 40°F [4.4°C] |
| Maximum Ambient Air | 100°F [37.8°C] | 100°F [37.8°C] |
| Minimum Entering Air | 50°F [10.0°C] | 15°F [-9.4°C] |
| Maximum Entering Air | 110°F [43°C] | 80°F [26.7°C] |
| Water Limits | | |
| Minimum Entering Water | 35°F [1.7°C] | 35°F [1.7°C] |
| Maximum Entering Water | 105°F [1.7°C] | 90°F [32.2°C] |

Note: The manufacturer strongly recommends all piping connections, both internal and external to the unit, be pressure tested by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. Test pressure may not exceed the maximum allowable pressure for the unit and all components within the water system. The manufacturer will not be responsible or liable for damages from water leaks due to inadequate or lack of a pressurized leak test, or damages caused by exceeding the maximum pressure rating during installation.

Prior to Start-up - A complete startup will minimize operational problems and expensive callbacks. Read this section thoroughly before attempting to commission the ClimateMaster DOAS unit. Always disconnect the power before servicing the equipment!

Note: For information regarding the factory-supervised start-up with your system, refer to the Service Bulletin towards the later part of this manual.

1. LEAK TEST ALL FIELD AND FACTORY PIPING.
Shipping and handling may have caused refrigerant leaks inside the DOAS unit.
2. Check the rating plate for power requirements. The available power supply voltage must be within $\pm 5\%$ of the voltage printed on the rating plate.
3. Verify that all field wiring matches the ClimateMaster wiring schematics. Inspect and tighten all field and factory wiring.

4. Check and adjust the belt tension for a ½ -inch deflection at the mid-point of the blower belt(s) when approximately 5 pounds of pressure is applied.
5. Check the drain pan and the condensate piping. Test the drain and prime the p-trap by pouring water into the drain pan.
6. Verify that all service valves in the refrigeration lines are fully open.
7. Inspect the air filters and coils to assure they are clean. If necessary, clean the coils and install new air filters.
8. Purge any air, dirt, and debris from water lines (if used) to avoid clogging the internal passages of optional heating coils or water side heat exchangers.
9. Make sure that the unit is level and securely mounted so that it cannot shift or transmit vibration to the building.

Start-up Procedure - First, read and understand the "Start-Up Report" which was shipped with the DOAS unit. ClimateMaster uses the start-up report to verify the integrity of each installation. A thorough start-up can reduce callbacks and can help increase customer satisfaction. Carefully follow the process detailed in the start-up report. Mail or fax the completed start-up report back to ClimateMaster to validate your unit's warranty. Be sure to keep a copy for future reference. If you do not have a start-up report, call the ClimateMaster Service Department at (405) 745-6000 for a new copy. Please be prepared with the model and serial number of the DOAS unit. THE START-UP REPORT IS REQUIRED FOR WARRANTY VALIDATION.

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System Start-up Report - A copy of the system start up report can be found in the back of this manual. This report needs to be filled out thoroughly by a qualified service technician and returned to ClimateMaster for warranty validation. Please ensure that the model and serial number of the unit is noted on this form. The model and serial number can be found on the systems rating plate located on or near the electrical compartment service door. Failure to complete and return this form will void the units warranty. These reports are also helpful when trying to correct existing problems. Should you need system diagnosis help, fax the completed worksheet to the ClimateMaster Service Department using the number provided. Be sure to include your name and a telephone number where you can be reached.

Start-up Supervision Supplemental Information

(Optional) - A ClimateMaster factory startup is required to be purchased with the equipment. A factory startup includes several key services:

- The expertise of an accomplished, factory-trained mechanic who will supervise the commissioning of the equipment.
- This ClimateMaster representative will assist the installing contractor with filling out the Startup Report.
- He will also inspect the installation to make sure that the DOAS unit has been properly integrated with the rest of the equipment on the jobsite.
- Finally, he can train the maintenance personnel to operate and service the equipment if necessary.

A factory start up does not include installation assistance. The installing contractor is responsible for ensuring that the system is ready for startup when the ClimateMaster representative arrives.

When the installing contractor is confident the system will be ready, he should contact the ClimateMaster Sales representative to schedule the startup. Please call at least two weeks before the desired startup date to help prevent scheduling conflicts.

Refrigeration System Operating Pressures - Many factors affect the operating pressures on a given day. Such factors include ambient temperature, air flow volume, and relative humidity. The following ranges are typical:

Tranquility Models:

- HFC-410A Normal suction pressure range: 85 to 150 psig
- HFC-410A Normal discharge pressure range: 300 to 500 psig

Note: Always check the system air flow before you troubleshoot the refrigeration circuit.

System Operation Modes

Principle of Operation - Tranquility DOAS Units - The Tranquility DOAS unit conditions 100% outdoor air. Its refrigeration system extracts heat from, or rejects heat into a building loop or geothermal loop to maintain either the supply air or the space temperature. Its mode of operation depends on whether the outdoor air is above or below design conditions. A factory-installed temperature sensor and a relative humidity sensor allow the controller to dehumidify outdoor air if it is too humid (usually above a 55°F dewpoint).

Humid Outdoor Air - When there is a demand for outdoor air and the air is above the design setpoint, the refrigeration circuit is activated. The multiple-row evaporator removes excess moisture from the airstream. A portion of the energy absorbed by the evaporating refrigerant is directed to a reheat condenser inside of the DOAS unit, which then reheats the dried airstream.

Dry Outdoor Air - When there is a demand for outdoor air and that air is below the design setpoint, the refrigeration circuit of the Tranquility is deactivated. If the system is equipped with an auxiliary heating coil (optional), it will turn on to heat the outdoor air to the desired temperature.

The Tranquility DOAS will energize its compressors to extract energy from a building loop or geothermal loop. The system will divert this energy to its hot gas reheat coil to heat the outdoor air to the desired temperature.

Temperature Control Strategies - There are three temperature control strategies available on the Tranquility makeup air DOAS units. Those standard control sequences include:

- **LAT Control** – The temp sensor is mounted in the supply duct. The DOAS unit will maintain a constant supply air temperature setpoint.
- **Room Reset of LAT** – Temperature sensors are mounted in both the conditioned space and the supply duct. The unit will maintain a constant discharge air temperature setpoint. However, the LAT setpoint is automatically set higher or lower depending on whether the conditioned space needs heating or cooling.
- **Unoccupied Temperature and/or Humidity Control** - A space mounted temperature and/or relative humidity and damper box sensor is required. During the unoccupied mode, the compressors will be cycled on if space heating or cooling is required, or if the space RH exceeds the setpoint.

Controller Setpoints - To avoid ongoing controller adjustments, adjust your setpoints accurately. It takes time for the unit to establish equilibrium at a given setpoint. Therefore, continued setpoint adjustments may lead to higher energy consumption and user discomfort.

Leaving Air Temperature Control Option (LAT) -

Adjustments to the supply temperature can be made with the user interface or over a DDC network. The controller will send a signal to the auxiliary heater (where applicable) to accurately maintain the supply air temperature during the winter months. In the summer, when the mechanical dehumidification is active, the controller maintains the leaving air temperature by modulating the flow of hot refrigerant to the hot gas reheat coil.

Tranquility systems equipped with this option are provided with a supply air temperature sensor and a duct-mounted sensor holder. See the holder cut sheet for assembly and installation details. Mount the sensor at least five feet downstream from the supply blower. Do not mount the sensor where it can “see” the auxiliary heater, since the radiation from the surface of the heater can affect the sensor’s accuracy.

Room Reset of Leaving Air Temperature Control Option (RRLAT) -

In this sequence, the controller will send a signal to the auxiliary heater (where applicable) to accurately reset the supply air temperature based on the deviation of the space temperature from its setpoint during the winter months. In the summer, when the mechanical dehumidification is active, the controller resets the supply air temperature to meet the needs of the space by modulating the flow of hot refrigerant to the hot gas reheat coil.

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Tranquility systems equipped with this option are provided with a supply air and a room temperature sensor, a wall-mounted sensor housing, and a duct-mounted sensor holder. See the housing and holder cut sheets for assembly and installation details. Mount the space sensor in an area where its accuracy will not be affected by drafts, hot spots, or solar gain. Mount the supply air sensor at least five feet downstream from the supply blower and auxiliary heater. Do not mount the sensor where it can “see” the auxiliary heater, since the radiation from the surface of the heater can affect the sensor’s accuracy.

Unoccupied Temperature and/or Humidity

Control Option - This sequence is the standard control strategy with the mixing box option and is the same control strategy as Room Reset of LAT (described above) in the occupied mode. The difference is the room sensor is a temperature/humidity sensor which allows the DOAS Unit to maintain an alternate space temperature and humidity set point in the unoccupied mode. The outdoor air temperature and humidity sensor do not affect unit operation in this mode. The DOAS controller will output signals in the unoccupied mode only for the following:

- **Unoccupied Room Air Temperature Above 85° F**
At this condition, the compressor will be activated and divert all refrigerant to the condenser. This will cool the space until the room temperature is 5°F below this setpoint. The default setpoint is 85°F and is only field-adjustable via optional remote display. However, it may be factory-set to customer specifications.
- **Unoccupied Room Air Temperature Below 55°F**
At this condition, the controller will command full heat to an auxiliary SCR-type electric heater. The controller will activate the compressor and fully open the EEV to divert hot gas refrigerant through the reheat coil. Only when either of the two previously described options is available, the space will be heated until the room temperature is 5°F above this set point. The default setpoint is 55°F and is only field-adjustable via optional remote display. However, it may be factory-set to customer specifications.
- **Unoccupied Room Air Humidity above 65% RH**
The DOAS controller will modulate refrigeration components to maintain the room temperature at the room temperature setpoint until the relative humidity is 5% below this setpoint.

Service and Maintenance

You can prevent many future problems by adhering to the recommended maintenance schedule shown. If you do discover a problem with the DOAS unit or the installation, refer to the TROUBLESHOOTING GUIDE. IF YOU HAVE EXHAUSTED THE TROUBLESHOOTING GUIDE AND HAVE NOT DISCOVERED THE PROBLEM, CALL THE CLIMATEMASTER SERVICE DEPARTMENT AT (405) 745-6000. BE PREPARED WITH THE MODEL AND SERIAL NUMBER OF YOUR DOAS UNIT.

Routine Maintenance - ClimateMaster DOAS units are designed for years of reliable service. However, like any piece of machinery they require periodic maintenance.

Service Monthly

- Check the air filters and replace them if necessary.
- Check the coils in the DOAS unit. Use compressed air or a commercial coil cleanser if they are dirty or plugged.
- Check the blower belts in the DOAS unit for wear, glazing, and proper tension. Replace the belts if necessary. Adjust the belts for approximately one half-inch deflection at their midpoints.

⚠ WARNING! ⚠

WARNING! Disconnect power before adjusting belts. Failure to disconnect power could result in death or serious injury.

⚠ WARNING! ⚠

WARNING! Disconnect power before tightening terminals. Failure to disconnect power could result in death or serious injury.

Service Semi-Annually

- Tighten all field and factory electrical connections. Mechanical vibration and thermal expansion can loosen wires and terminals, which may lead to erratic operation.
- Inspect and clean the condensate drain line(s) if necessary. A clogged drain line can overflow and cause extensive property and equipment damage.

Compressor Failure - Although some compressors fail because they are mechanically flawed, most failures are due to system-related problems. Compressor failure can be caused by liquid floodback, air or moisture in the refrigerant system, solid contaminants, excessive heat or electrical service malfunctions. To avoid repeated callbacks, you must determine the cause of the failure and then correct it.

If the compressor has failed because its motor has burned out, the refrigerant, oil, and piping may have become severely contaminated. If a burnout has occurred, use the following procedure to replace the compressor and clean the refrigerant system. **YOU MUST CLEAN THE SYSTEM THOROUGHLY TO PREVENT REPEATED COMPRESSOR BURNOUTS!** Use an oil test kit to determine the severity of the burnout. Make sure you use rubber gloves and eye protection, as contaminated refrigerant and oil can cause severe burns!

Mild Burnouts - If the burnout is mild, recover the refrigerant charge or transfer it to an unused portion of the refrigeration circuit such as the receiver. You may need to energize the liquid line solenoid valve to evacuate the circuit completely. On systems equipped with an optional tower water condenser, take care to avoid freezing the condenser during evacuation.

If the compressor is equipped with rotolock valves, you may want to install and evacuate the new compressor, and use it to pump down the charge.

Notice! - Do not attempt this when a severe burnout has occurred!

- Remove the old compressor.
- Install the new compressor. Be careful not to overheat its pipe stubs if it is not equipped with rotolock connections.
- Replace the suction filter with a suction line filter-drier. Sporlan Valve Corporation manufactures special "HH" filter-driers for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. If you install a filter without a tap, solder a tap in the suction line immediately upstream of the filter.
- Remove the old liquid line filter-drier and replace it with a new "HH" type filter one size larger than the original.
- Evacuate the system to purge the moisture and non-condensables from it. You may need to energize the liquid line solenoid to evacuate all portions of the refrigeration circuit.

Check the piping and joints for leaks, and recharge the system.

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Severe Burnouts

- If the burnout is severe, recover the refrigerant charge or transfer it to an unused portion of the refrigeration circuit such as the receiver. You may need to energize the liquid line solenoid valve to evacuate the circuit completely. On systems equipped with an optional tower water condenser, take care to avoid freezing the condenser during evacuation.
- Verify that the TXV and solenoid valves are not plugged with debris. Clean or replace them if necessary.
- Replace the suction filter with a suction line filter-drier.
- Check the compressor contractor for damage or pitted contacts. Some single-phase compressors are equipped with start capacitors, run capacitors, and starting delays. Check these components and replace them if necessary.
- Check the piping and joints for leaks, and recharge the system.
- Run the refrigeration system for an hour while you monitor the pressure drop across the suction filter. If the pressure drop is 3 psig or less after one hour, continue to run the system for 24 hours, then take an oil sample.
- If the oil sample is dirty or acidic, or if the one-hour pressure drop is greater than 3 psi, then recover the system charge and replace both the suction and liquid filter-driers. Repeat the previous step until your oil sample tests negative.

Sporlan Valve Corporation manufactures special “HH” filter-driers for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. If you install a filter without a tap, solder a tap in the suction line immediately upstream of the filter.

- Remove the old liquid line filter-drier and replace it with a new “HH” type filter one size larger than the original.
- Remove the old compressor if you have not already done so.
- Install the new compressor. Be careful not to overheat its pipe stubs if it is not equipped with rotolock connections.
- Evacuate the system to purge the moisture and non-condensables from it.

Troubleshooting

Supply Blower Will Not Run

| Possible Cause | Remedy |
|-----------------------------------|---|
| "Occupied switch in open position | Close "Occupied" switch |
| Loss of main power | Check for tripped circuit breaker or blown fuse |
| Blower overload has tripped | Correct cause and reset overload |
| Faulty control wiring | Check for loose or incorrect wires on system and controller |

Compressor Will Not Run

Note: When there is a demand for outdoor air (the "occupied" switch is on) and the outdoor air does not need mechanical dehumidification, the compressor and the refrigeration circuit of the unit will be locked out.

| Possible Cause | Remedy |
|---|---|
| Loss of main power | Check for tripped circuit breaker or blown fuses |
| Blower overload has tripped | Correct cause and reset overload |
| Faulty wiring | Check for loose or faulty wiring on system and controller |
| Compressor overload has tripped | Correct cause and reset overload |
| Compressor failure may have occurred if: A: Compressor draws locked rotor amps B: Compressor starts but does not pump C: Motor windings have shorted | A: Replace compressor (or check fuses on three-phase units) B: Replace compressor C: Replace compressor |
| Compressor delay-timer | Wait 3 minutes for timer |

⚠ CAUTION! ⚠

CAUTION! Do not restart units without inspection and remedy of faulting condition. Equipment damage may occur.

Evaporator Coil Ices Up: Suction Pressure Below 85 psig (HFC-410A)

| Possible Cause | Remedy |
|---|---|
| Faulty or improperly set hot-gas bypass valve | 1: Set hot-gas valve to maintain 30°F suction (55 psig) 2: Replace if defective |
| Insufficient evaporator air flow rate | Assure air coil is clean and belts are tight |
| Lack of refrigerant | Reevaluate system charge |
| Restricted refrigerant filter-drier | Evaluate filter pressure drop and replace if necessary |
| Defective expansion valve | Evaluate expansion valve performance and replace if necessary |
| Restriction in refrigeration piping | 1: Check coil for kinks in tubing 2: Check for debris in distributor |
| Liquid Line Solenoid | 1: Check for 24 volts at the coil 2: Check to make sure solenoid is tightly secured to the stem of the valve |

Head Pressure is Too High: Above 500 psig (HFC-410A)

| Possible Cause | Remedy |
|---|---|
| Lack of adequate water flow | Install flow meter or circuit setter to ensure correct flow rate |
| Excessive incoming water temperature | If water temperature is above 90°F, consult factory for required flow rates |
| Excessive air in condenser water lines | Purge lines thoroughly or install an air eliminator in the system piping |
| A: Overload tripped (3-phase only) B: Contactor faulty C: Blower cycling on internal overload (single phase only) | A: Reduce blower speed and reset overload B: Replace contactor C: Reduce blower speed |
| Service valves closed or not fully open | Fully open service valves |
| Non-condensables in refrigeration system | Short-Term: Bleed non-condensables from high-point purge points in system Long-Term: Properly evacuate and recharge refrigeration system |

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Appendix

Figure 9: System Rating Plate

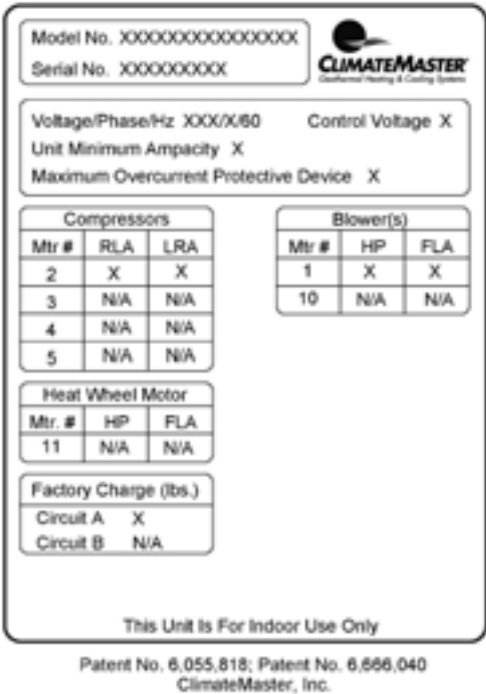
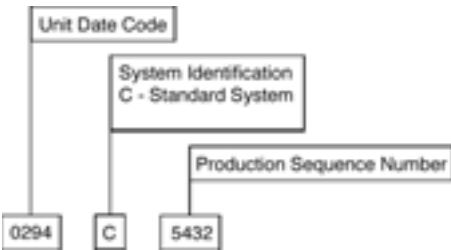


Figure 10: Model Numbering Matrix



The system rating plate is attached to the outside of the electrical box door. You will need rating plate information when you install and service the DOAS unit.

Service Bulletin

DEDICATED OUTDOOR AIR SYSTEM (DOAS)**Factory Pre-Commissioning Form, Pg. 1**

Factory Commissioning of the DOAS system is required and is included in the sale of all DOAS units. Commissioning requires a ClimateMaster Service Dept. Technician to visit the installation site and provide supervisory experience to installing/commissioning contractor(s) as they perform the required procedures as outlined in our warranty activation commissioning report. The company technician may also present an educational review of the DOAS unit operating and maintenance requirements. As an option, and at the company's discretion, a **Certified Service Technician (CST) Commissioning** may be performed. A CST Commissioning is performed by a local Certified Service Technician who has been trained by the manufacturer. The CST will perform all of the duties of the factory technician including commissioning supervision and maintenance and operation training.

To schedule a factory supervised commissioning this Pre-commissioning Form must be completed in its entirety and returned to the ClimateMaster Technical Service Dept. Travel arrangements for commissioning will not be made until Pre-commissioning forms are signed, returned to, and approved by the ClimateMaster Technical Service Dept. Allow three (3) weeks for site visit scheduling.

The DOAS unit must be operable on the scheduled commissioning date. If, on the scheduled date, commissioning cannot be completed and a return trip must be scheduled a Purchase Order for the second trip must be issued to ClimateMaster. Delays and/or changes to a scheduled commissioning less than five (5) business days in advance may result in additional charges. Commissioning delays on-site of more than 4 hours during commissioning may result in additional charges.

The ClimateMaster Technical Service Dept. will advise contractors of their responsibilities and coordinate all site visits. The responsible contractor will be advised if a factory technician or a CST will perform the commissioning.

The following list of items will apply to all DOAS unit commissioning and are the responsibility of the installing contractor. In the event any of the following equipment cannot be furnished for the commissioning contact the ClimateMaster Technical Service Dept. at (405) 745-6000 prior to signing/submitting this document.

Items required for commissioning:

- | | |
|---|---|
| <input type="checkbox"/> Equipped service vehicle and qualified service technician. Tech will be trained by factory tech/CST. | <input type="checkbox"/> Ensure DOAS unit is installed in accordance with IOM requirements. |
| <input type="checkbox"/> Refrigerant manifold gauges. (2-sets, R410A or R22 as needed) | <input type="checkbox"/> Condensate drain line with P-trap is installed. |
| <input type="checkbox"/> Air balancing equipment (magnehelic or manometer differential pressure gauge). | <input type="checkbox"/> All electrical terminations properly connected and tightened. |
| <input type="checkbox"/> DMM and Amperage meters. | <input type="checkbox"/> All field installed controls and sensors are installed and properly connected. Field installed controls and sensors include the user interface, S/A sensor, and possibly room Temp/RH sensors. |
| <input type="checkbox"/> Digital thermometer with sensors. | <input type="checkbox"/> Inspect all water lines for leaks and purge all air from DOAS unit heat exchangers. |
| <input type="checkbox"/> 50# of refrigerant (see unit type) & refrigerant scales. | <input type="checkbox"/> Verify water-piping connections are correct and leak free. |
| <input type="checkbox"/> Hand refrigerant oil pump. | <input type="checkbox"/> Verify water flow valve is installed and rated for correct GPM flow rate. See unit labeling for GPM requirement and details. |

Items to be completed prior to commissioning:

- | | |
|---|---|
| <input type="checkbox"/> Open all access panels and inspect unit for concealed shipping damage. Contact ClimateMaster immediately if damage is noted. Do not repair damage without consulting factory. Photograph all damage. | <input type="checkbox"/> Verify strainer (60 mesh or finer) is installed in supply water line. |
| <input type="checkbox"/> Leak check DOAS unit with a hand-held refrigerant leak detector. Check and record refrigerant pressure of all refrigerant circuits. Check and record ambient temperature where unit is located. | <input type="checkbox"/> Verify water temperature is within unit specifications. |

A MINIMUM THREE (3) WEEK LEAD TIME IS REQUIRED TO SCHEDULE A DOAS UNIT COMMISSIONING.

**Submit forms to: Attn: ClimateMaster Technical Service Dept. Fax (405) 745-6058
ClimateMaster 7300 S.W. 44th Street Oklahoma City, OK, 73179 (405) 745-6000**

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Pre-Commissioning Form, Pg. 2

Complete one (1) each this page for each DOAS unit

Unit Information Model # _____

Serial # _____

Refrigerant pressure (standing): Circuit A _____ Circuit B _____

Ambient Temperature (degree F @ unit): _____

Contractor information

Company Name: _____

Address: _____

Contact Phone: _____ Fax: _____

Jobsite Information

Jobsite Address: _____

Contact Name: _____ Cell Ph: _____

Signature, Job Site Supervisor: _____ Date: _____

Water Test & Balance

Company Name: _____

T & B Technician Name (print): _____ Phone: _____

T & B Completion Date: _____

ClimateMaster Sales Representative

Company Name: _____

Contact/Salesman Name: _____

A MINIMUM THREE (3) WEEK LEAD TIME IS REQUIRED TO SCHEDULE A DOAS UNIT COMMISSIONING.Submit forms to: Attn: ClimateMaster Technical Service Dept. Fax (405) 745-6058
ClimateMaster 7300 S.W. 44th Street Oklahoma City, OK, 73179 (405) 745-6000

Start-Up Report

DEDICATED OUTDOOR AIR SYSTEM (DOAS)

Commissioning Report, Tranquility and Genesis Series Heat Pumps, Pg. 1

IMPORTANT: For warranty validation and activation a copy of this form must be completed for each ClimateMaster DOAS unit and form must be returned to ClimateMaster Technical Service Dept. immediately after completion of commissioning. Warranty shall not be considered valid or active without verification from the ClimateMaster Technical Service Dept. For warranty status contact:

ClimateMaster Inc.
C/O Service and Warranty Dept.
7300 S.W. 44th Street
Oklahoma City, OK, 73179
(405) 745-6000

INSTRUCTIONS

- Prior to Commissioning read and become familiar with the DOAS unit Installation and Operation Manual (IOM) and the CM3500 Controller Application and Operation Manual (AOM). If you do not fully understand the manuals or require additional information contact the ClimateMaster Technical Service Dept. Be prepared to quote unit model number(s) and serial number(s).
- Use one (1) each Commissioning Report per unit. One report will be required for each DOAS unit. Clearly print all required information. Additional comments or pages may be attached as needed.

⚠ WARNING! ⚠

ONLY TRAINED, QUALIFIED PERSONNEL SHOULD INSTALL AND/OR SERVICE CLIMATEMASTER EQUIPMENT. SERIOUS INJURY, PROPERTY DAMAGE, AND/OR DEATH CAN RESULT FROM IMPROPER INSTALLATION AND/OR SERVICE OF THIS EQUIPMENT. HIGH VOLTAGE ELECTRICAL COMPONENTS, MOVING PARTS, AND HIGH REFRIGERANT PRESSURES ARE PRESENT.

Location and Unit Information

| | |
|---|------------------|
| Job Name: _____ | |
| Installation Address: _____ | |
| ClimateMaster Sales Representative: _____ | |
| Unit Model #: _____ | Serial #: _____ |
| Form Completed by (print): _____ | Signature: _____ |
| Company Name: _____ | Date: _____ |
| Company Address: _____ | |
| Phone #: _____ | Fax #: _____ |

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Commissioning Report, Tranquility and Genesis Series Heat Pumps, Pg. 2

INSTALLATION CHECK LIST

- | | | |
|---|--|--|
| <input type="checkbox"/> Installation Manual Read & Understood <input type="checkbox"/> DOAS Unit Properly Installed <input type="checkbox"/> Condensate Drain Installed, Trapped, Primed <input type="checkbox"/> Verify Power Supply Matches Unit Data Plate | <input type="checkbox"/> Tighten/Check all Field & Factory Wiring Connections <input type="checkbox"/> Check Blower Belt Tension <input type="checkbox"/> Check Blower rotation (3 ph Units Only) <input type="checkbox"/> Open ALL Manual Refrigerant Valves | <input type="checkbox"/> Leak Check Unit With Hand-Held Leak <input type="checkbox"/> Check for Internal Damage <input type="checkbox"/> Leak Check Unit With Hand-Held Leak Detector <input type="checkbox"/> Verify Water Flow & GPM <input type="checkbox"/> Verify Air Filters Installed & Clean |
|---|--|--|

| POWER SUPPLY | | BLOWER(S) OPERATION | | |
|---|-----------|-----------------------------|-------|------------|
| Check voltage <u>without</u> motors operating | | Check with motors operating | | |
| | | Supply Fan | | Return Fan |
| Voltage @ Power Dist. Block | L1-L2 | Voltage @ Design Airflow | L1-L2 | L1-L2 |
| | L1-L3 | | L1-L3 | L1-L3 |
| | L2-L3 | | L2-L3 | L2-L3 |
| Voltage @ Main Transformer | Line Volt | Amperage @ Design Airflow | L1 | L1 |
| | Low Volt | | L2 | L2 |
| | | | L3 | L3 |

| WATER SYSTEM | | | | |
|-----------------------------------|----------|--|----------|-----------|
| Water Piping Size (O.D.) | | Loop Type | | |
| Pressure Drop | PSI / ft | Antifreeze in Loop | Type / % | |
| MWV Installed | Y / N | Strainer Installed | Y / N | Mesh Size |
| AFR Installed | Y / N | Heat Tape Installed/Operable | | |
| Y / N | | | | |
| Temperature and Relative Humidity | | | | |
| Space Temperature | °F | Outdoor Air Temperature | °F | |
| Space Relative Humidity | %RH | Outdoor Air Temperature | %RH | |
| Reheat Condenser Static Pressure | “wc | Enthalpy Wheel Supply Static Pressure | “wc | |
| Supply Duct Static Pressure | “wc | Enthalpy Wheel Exhaust Static Pressure | “wc | |
| Return Duct Static Pressure | “wc | Enthalpy Wheel Amps | A | |

Continued on Next Page

Commissioning Report, Tranquility and Genesis Series Heat Pumps, Pg. 3

DOAS units have warm weather and cold weather modes of operation. Each mode **MUST** be tested and documented for warranty Validation. For additional information contact ClimateMaster Technical Service Dept. @ (800) 299-9747.

| WARM WEATHER OPERATION (COOLING MODE) | | | | |
|--|-----------|-------|-----------|-------|
| | Circuit A | | Circuit B | |
| Voltage @ Compressor Contactor (Compressor Operating) | T1-T2 | T1-T2 | T1-T2 | T1-T2 |
| | T1-T3 | T1-T3 | T1-T3 | T1-T3 |
| | T2-T3 | T2-T3 | T2-T3 | T2-T3 |
| Compressor Amperage | L1 | L1 | L1 | L1 |
| | L2 | L2 | L2 | L2 |
| | L3 | L3 | L3 | L3 |
| Refrigerant Discharge Pressure | Psig | | Psig | |
| Refrigerant Liquid Line Temperature | °F | | °F | |
| Subcooling | °F | | °F | |
| Refrigerant Suction Pressure | Psig | | Psig | |
| Suction Temperature | °F | | °F | |
| Superheat | °F | | °F | |
| EWT / LWT / Td | °F | | °F | |

| COLD WEATHER OPERATION (HEATING MODE) | | | | |
|--|-----------|-------|-----------|-------|
| | Circuit A | | Circuit B | |
| Voltage @ Compressor Contactor (Compressor Operating) | T1-T2 | T1-T2 | T1-T2 | T1-T2 |
| | T1-T3 | T1-T3 | T1-T3 | T1-T3 |
| | T2-T3 | T2-T3 | T2-T3 | T2-T3 |
| Compressor Amperage | L1 | L1 | L1 | L1 |
| | L2 | L2 | L2 | L2 |
| | L3 | L3 | L3 | L3 |
| Refrigerant Discharge Pressure | Psig | | Psig | |
| Refrigerant Liquid Line Temperature | °F | | °F | |
| Subcooling | °F | | °F | |
| Refrigerant Suction Pressure | Psig | | Psig | |
| Suction Temperature | °F | | °F | |
| EWT / LWT / Td | °F | | °F | |

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Additional Comments: _____

Warranty

CLIMATE MASTER, INC.

LIMITED EXPRESS WARRANTY/ LIMITATION OF REMEDIES AND LIABILITY FOR TRANQUILITY OA (TO) SERIES AND GENESIS OA (GO) SERIES PRODUCTS



It is expressly understood that unless a statement is specifically identified as a warranty, statements made by Climate Master, Inc., a Delaware corporation, ("CM") or its representatives, relating to CM's products, whether oral, written or contained in any sales literature, catalog, agreement, are not express warranties and do not form a part of the bargain, but are merely CM's opinion or commendation of CM's products. **EXCEPT AS SPECIFICALLY SET FORTH HEREIN, THERE IS NO EXPRESS WARRANTY AS TO ANY OF CM'S PRODUCTS. CM MAKES NO WARRANTY AGAINST LATENT DEFECTS. CM MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.**

GRANT OF LIMITED EXPRESS WARRANTY

CM warrants only to its original purchaser all CM Tranquility OA (TO) Series and Genesis OA (GO) Series units purchased and retained in the United States of America and Canada to be free from defects in material and workmanship under normal use and maintenance as follows: (1) All complete units built or sold by CM for twenty-four (24) months from date of shipment (from factory); (2) Repair and replacement parts, which are not supplied for ninety (90) days from date of shipment (from factory). All parts must be returned to CM's factory in Oklahoma City, Oklahoma, freight prepaid, within sixty (60) days after the date of the failure of the part; if CM deems the part to be defective and within CM's Limited Express Warranty, CM shall, when such part has been either replaced or repaired, such as a factory recognized dealer, contractor or service organization, F.O.B. CM's factory, Oklahoma City, Oklahoma, freight prepaid. This warranty on any part repaired or replaced under warranty expires at the end of the original warranty period. In order for this warranty to be valid, a START-UP REPORT in the form contained in CM's Installation, Operation and Maintenance Instructions (the "START-UP REPORT") must be properly completed and timely returned to CM immediately after unit start-up, but in no event later than one (1) week after unit start-up.

This warranty does not cover and does not apply to: (1) Air filters, fuses, refrigerant fluids, oil; (2) Products relocated after initial installation; (3) Any portion or component of any system that is not supplied by CM, regardless of the cause of the failure of such portion or component; (4) Products on which the unit identification tags or labels have been removed or defaced; (5) Products on which payment to CM is or has been in default; (6) Products which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance, or are caused by accident, misuse, abuse, fire, flood, alteration of the product; (7) Products which have been subjected to corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damage; (9) Products subjected to conditions which result from a contaminant, or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (10) Products manifested or supplied by others; (11) Products which have been subjected to misuse, negligence or accidents; (12) Products which have been installed and/or operated in violation of CM's printed instructions; (13) Products which have defects, damage or insufficient performance as a result of inefficient or incorrect system design; or (14) Products for which a START-UP REPORT has not been properly completed and timely returned to CM; or (15) Products that may have been altered or repaired in any way outside of the factory in such a manner so as to affect, in CM's sole judgment, the ability of functionality of the Product.

CM is not responsible for: (1) The costs of any fluids, refrigerant or other system components, or associated labor to repair or replace the same, which is incurred as a result of a defective part covered by CM's Limited Express Warranty; (2) The costs of labor, refrigerant, materials or service incurred in diagnosing the problem, removal of the defective part, or in obtaining and replacing the new or repaired part; or, (3) Transportation costs of the defective part from the installation site to CM or of the return of any part not covered by CM's Limited Express Warranty.

Limitation: This Limited Express Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such express warranty, including without limitation any express warranties or any implied warranties of fitness for particular purpose and merchantability shall be limited to the duration of the Limited Express Warranty.

LIMITATION OF REMEDIES

In the event of a breach of the Limited Express Warranty, CM will only be obligated at CM's option to repair the failed part or unit or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If after thirty (30) days CM's factory in Oklahoma City, Oklahoma, of each defect, malfunction, or other failure and a reasonable number of attempts by CM to correct the defect, malfunction or other failure, and the remedy fails of its essential nature, CM shall refund the purchase price paid to CM in accordance with the terms of this section. Said refund shall be the sole and exclusive remedy of CM. **THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER AGAINST CM FOR THE BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR CM'S NEGLIGENCE OR IN STRICT LIABILITY.**

LIMITATION OF LIABILITY

CM shall have no liability for any damages if CM's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to any war, civil unrest, government restrictions or restraints, strikes or work stoppages, fire, flood, accident, shortages of transportation, fuel, material, or labor, acts of God or any other person beyond the sole control of CM. **CM EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR CM'S NEGLIGENCE OR AS STRICT LIABILITY.**

OBTAINING WARRANTY PERFORMANCE

Normally, the contractor or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any CM recognized dealer, contractor or service organization. If assistance is required in obtaining warranty performance, write or call:

Climate Master, Inc. • Customer Service • 7300 S.W. 44th Street • Oklahoma City, Oklahoma 73179 (405) 745 6000

NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and from Canadian province to Canadian province.

Please refer to the CM Installation, Operation and Maintenance Instruction for installation, operating and maintenance instructions.



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Notes:

Notes:

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Revision History

| Date: | Item: | Action: |
|----------|---|---|
| 01/31/13 | Decoder TO VF/VD Physical Data Table | Updated |
| | POE Oil Warning Unit Connection and Services Clearances 4-15 Tons and 20-30 Tons | Added |
| | Water Quality Table | Updated |
| 03/21/11 | Service Bulletin & Start-Up Report | Updated |
| 01/03/11 | Format - All Pages | Updated |
| 07/26/10 | Dimensional Data | Updated |
| 06/11/10 | Format - All Pages | Updated |
| 06/11/10 | GO (R22) Units | Removed |
| 02/06/09 | Decoder | Updated |
| 12/23/08 | Condensate Line Note | Updated |
| 09/09/08 | Pressure Testing Language | Updated |
| 06/06/08 | Duct System Installation, Water Quality Standards, Operating Conditions | Verbiage Updates |
| 05/21/08 | Pressure Testing Language | Added to Unit Starting and Operating Conditions |
| 05/14/08 | Physical Data | Inserted Physical Data Table |
| 05/14/08 | All Pages | Verbiage Updates |
| 05/14/08 | Wire Diagrams | Drawings Updated |
| 01/01/07 | First Published | |



97B0052N01

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Fax: 405-745-6058
climatemaster.com

ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time for order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-405-745-6000 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products.

ClimateMaster is a proud supporter of the Geothermal Exchange Organization - GEO. For more information visit geoexchange.org.